MECHANIX ILLUSTRATED

THE HOW-TO-DO MAGAZINE

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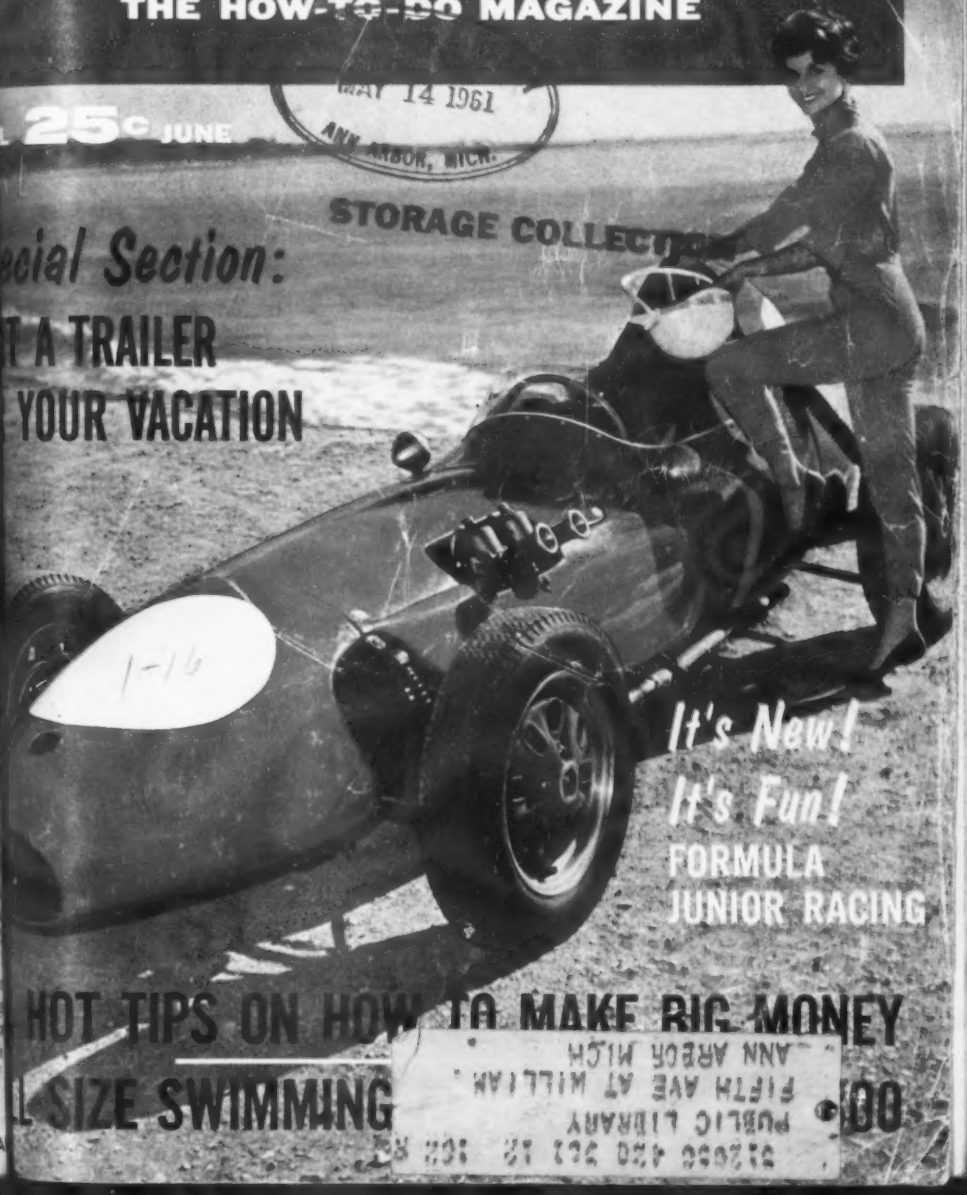

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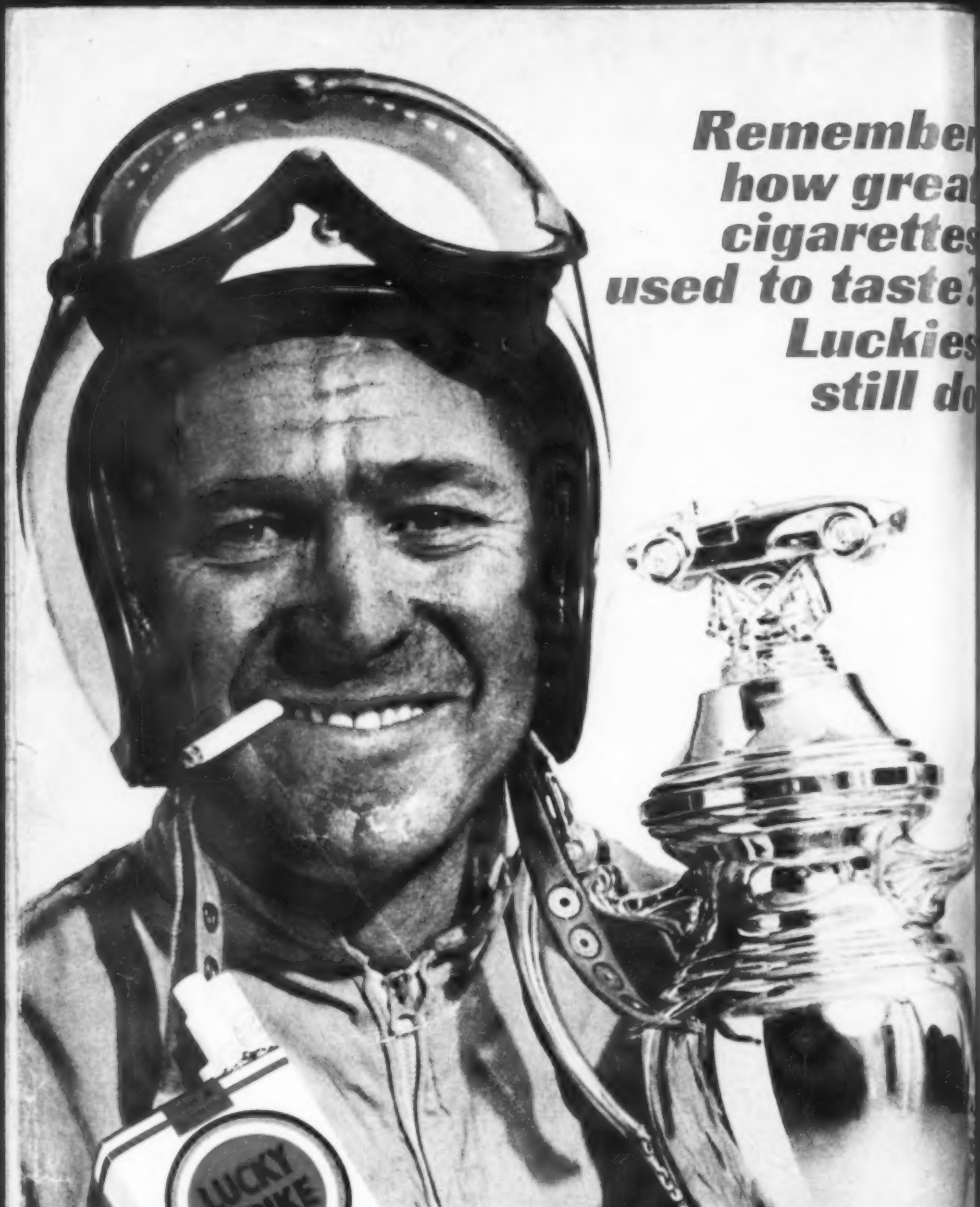

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SOUNDS like an Average Joe. And he is. Too average! He's got a job. It pays fairly well. He's satisfied.

But here's the catch. With the right kind of training, this young man could be stepping into better jobs. He could be making $7-8000 a year. He could be cashing in on those spare-time hours he now wastes.

As it stands now, he's stuck in his job. Can't seem to make any headway. He's reluctant to try. So he just hangs on.

This man is a "Security Risk" to his wife and children.

His family probably will never enjoy the comforts, the prestige, the good living that could be theirs. If hard times come, they are almost sure to be hurt. For an Average Joe can't expect to compete with trained men when the chips are down.

A man like this would do well to start a planned program of self-improvement. In his spare time. In a field related to his interests and abilities. Right NOW!

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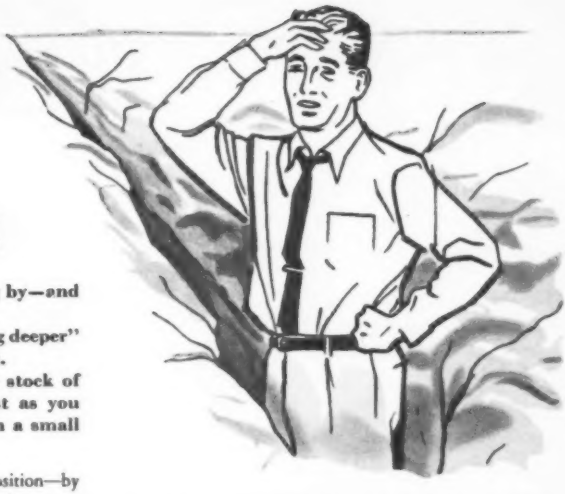
ME—in a Rut?
—COULD BE!



YES—you may be in a rut—just getting by—and not fully realizing it.

Every day you stay in that rut you "dig deeper"—make it harder and harder to get out.

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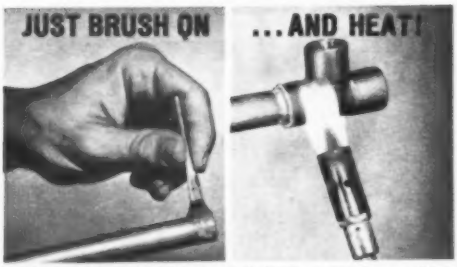

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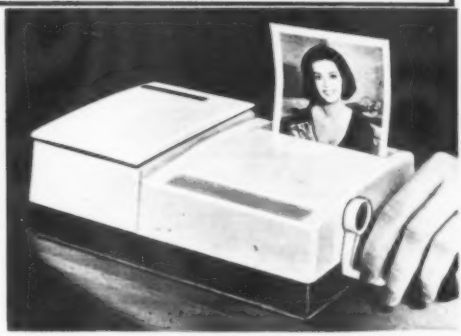

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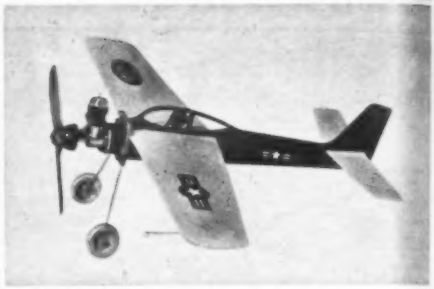

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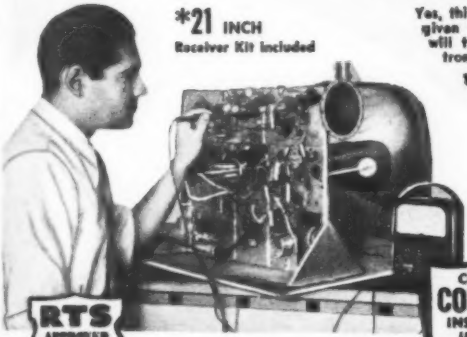

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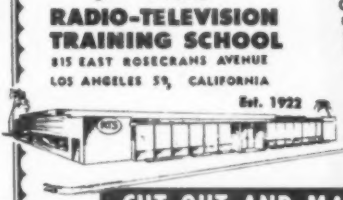

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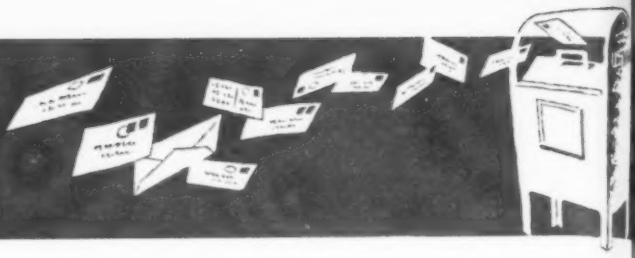

Address mail to: Letters Editor, MECHANIX ILLUSTRATED, 67 West 44th Street, New York 36, N. Y.

● *For Metric System*

At long last a bill has been introduced in the House of Representatives "To provide that the Secretary of Commerce shall conduct a study to determine the practicability and desirability of the adoption by the United States of the metric system of weights and measures." The bill has been referred to the Committee on Science and Astronautics and is H.R. 269 by Congressman James Roosevelt.

As an engineer I have always felt our scientists and engineers have been under the handicap of the present U.S. system of measurements.

Lewis J. Miller
Los Angeles, Calif.

● *Righted Reel*

Page 89 of a recent issue of your magazine (March MI) carries several pictures of MIMI using a fishing rod. However, she is shown holding the rod so that the open-face reel is on top when, in fact, it should be shown connected *underneath* the rod. Just a minor item but one that any fisherman would be sure to notice.

Bruce Campbell
Nowata, Okla

Would be sure to notice? With MIMI *in the photos?*

● *$$ For Pre-MI's*

I would like to buy some old issues of the magazine known as Modern Mechanix (MI's name before 1938), especially the years 1928 to 1934. Any readers who have these copies and are interested in selling them are cordially invited to write me.

Theodore Scheevel
3036 Humboldt Ave. S.
Minneapolis 8, Minn.

● *Sports Car Man Strikes Back*

Shame on thee, Mr. Petty! To suggest that sports car racers cannot drive (Meet Dick Petty, March MI) is akin to saying that Van Cliburn cannot play Chopsticks. Mr. Petty's bitterness toward the sport may stem from the fact that races like Sebring, Riverside and regionals satisfy the racing fans' appetites and thus decrease the purses available to stockers. As for his other comments I can only say that many drivers cut their teeth on stocks and then graduate to Indy or sports cars. I have never heard of the reverse happening.

James W. Jungblut
San Diego, Calif.

● *Solved Mystery*

MI's November '60 issue has a picture of a Whatsit on page 78. The caption reads: "Whatsit projectile hurler is a puzzle to antique men. Is it a gun, a toy, a tool, what? . . ."

In the days before World War I these "whatsits" were called Buster Brown Guns and were popular with youngsters celebrating the Fourth of July. I should mention that in those days every community had its share of Regulars (the rough and tumble fellows) and the Fauntleroys, with their lace cuffs and

[*Continued on page* 12]

Rocket Communications Tested

In an emergency, the U. S. may be able to get messages through to stations miles away via a rocket. A rocket that can broadcast messages from 300 miles up has been tested by the Air Research and Development Command as part of Project Tattle Tale. From 300 miles up, a message will travel 1,400 miles along the earth's curvature. The communications payload, developed by the Hughes Aircraft Corporation, was carried aloft by an Aerobee rocket.

Americans Grow Taller

Young men and women in the U. S. today average about two inches taller than those 60 years ago, a study of the heights and weights of adults over the past 100 years shows. Miss Milicent L. Hathaway and Miss Elsie D. Foard of the Department of Agriculture's Reasearch Service report that the younger generation in college in recent years has averaged about an inch taller than their parents. The sons weighed five to ten pounds more; the daughters, two to five pounds more.

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Dear Editor

[*Continued from page* 10]

collars. A little Fauntleroy would use his Buster Brown Gun to hurl lighted firecrackers. He would cock the gun, load it fuse-end-out with a firecracker, light the fuse with a bit of punk, then pull the trigger to catapult the firecracker in whatever direction he pointed the gun. The Regulars just lit the firecrackers and threw them by hand.

E. A. Hall
Boothwyn, Pa.

• *Hard Sell Prof*

The following is quoted in your recent story, Ringing Doorbells Can Make You Rich (March MI): "There is probably no other field where the rewards are so directly tied up with the efforts put forth and where the opportunities for reward are so rich." It is significant that this statement was made, not by a door-to-door salesman, but by a college professor.

Abdul Ibn Ahmed
Knoxville, Tenn.

The statement Abdul cites was made by Professor William McKeon, New York University marketing authority. As a matter of fact, Professor McKeon worked his way through college during the '30s selling Fuller Brushes door to door.

• *Alley-Ooops!*

With reference to Mr. Hartley Alley's article on the AR-15 (Colt's Revolutionary New Rifle, February MI): Mr. Alley writes that ". . . no citizen may own a fully automatic gun." It is my understanding that any reputable citizen—providing he pays the $200 federal transfer tax and registers the weapon—may own a machine gun or other fully automatic weapon.

Also, the author's statement that the .223 calibre ammunition is comparable to .22 magnum puzzles me. I am sure he cannot be comparing this to the .22 magnum rimfire—the only calibre of this name that I know of. The large centerfire round pictured with the ar-

ticle might be more like the .222 Remington magnum.

Robert A. Suomala
Riverton, N. J.

I stand corrected. The owning of a fully automatic weapon by an ordinary citizen is not absolutely forbidden. However, it is certainly discouraged in the interests of public safety. The National and Federal Firearms Acts passed in the '30s make it difficult for any but military and law enforcement agencies to own automatic weapons. It is true, however, as Mr. Suomala points out, that if you can prove you are a reputable citizen, pay a $200 tax and submit to being fingerprinted and photographed, you can obtain a nontransferable permit to own such a gun.

The .223 ammo used in the AR-15 is a special cartridge manufactured by Remington for use in the Colt gun and is similar to the .222 Remington magnum. The case shape has been altered slightly to give better automatic fire characteristics.

Hartley Alley

High Resolution Scanning Antenna

An antenna to provide scientists with a new tool for the study of the earth's reflecting layer of radio waves, the ionosphere, has been developed at the National Bureau of Standards. Without benefit of electrical or mechanical moving parts, the antenna scans an arc of 42 degrees and can determine immediately the direction of radio signals received from a "forward scatter" transmission. In this type of very high frequency radio propagation, radio waves are scattered from cloud-like concentrations of electrons in the lower ionosphere and may arrive at the receiver site from many directions. The new antenna can help pinpoint the direction from which the scattered signal arrives, and could prove of value in tracing the best paths for forward-scatter communication.

Animal's Heart Rates Lowered

Tiny radio transmitters surgically implanted in animals or, in some cases, attached to the animal's body with a light harness have broadcast true resting heart rates as much as 25 per cent lower than those recorded as standard in handbooks. The older resting rates were obtained by methods that restrained the animals and made them highly excitable but the new method permitted the animals to be tested without restraining wires. The work, reported to an American Institute of Biological Sciences meeting, was conducted by Dr. Warren O. Essler under the direction of Prof. G. Edgar Folk Jr. and Prof. Lawrence A. Ware at the State University of Iowa.

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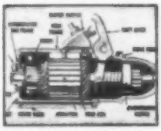

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WAS COLUMBUS SECOND?

IF theories of a small knot of Deep South historians prove to be fact, America's history books will need rewriting. Evidence is being gathered that Columbus didn't discover America after all, that he was some three centuries too late for the honor.

The real discoverer? A little-known Welsh prince named Madoc ab Owain Gwynedd. The date? 1170.

This much is established fact: the prince sailed from Wales with ten ships and 300 men. After an interminable voyage, the adventurers finally beached, as Madoc later put it, "On the beautiful shore where the gray moss hangs from the stately trees."

Madoc sent 120 of his followers northward to explore, then sailed back to Wales to recruit settlers. He never returned.

Did he leave his men in America? "Absolutely," says Hatchett Chandler, historian-custodian of Alabama's old Fort Morgan. Prince Madoc encamped on Mobile peninsula, says Chandler, and the 120 sailors trouped up Alabama rivers toward Tennessee, building crude forts along the way.

Indeed, the remains of three ancient fortresses—remarkably resembling those of ninth-century Wales—can be seen today. Near Manchester, a marker placed near one fort by the Tennessee Historical Commission states that it is believed to have been erected by Prince Madoc's followers.

This view seems to be backed up by old letters now in the possession of Chicago's Newberry Library. John Sevier, first governor of Tennessee, wrote of talking with Cherokee Chief Oconostota. The Chief told of the fort-builders, called Welsh, who "had crossed the great water and landed first near the mouth of the Alabama River near Mobile."

The Indian also told Sevier about an ancient book, possibly Welsh, owned by an old squaw. Unfortunately, the woman's house and all in it burned to the ground before the governor could investigate.

If the old book actually was Welsh, whatever happened to those pioneering Welshmen? According to Tennessee archaeologist Zella Armstrong, they merely melted into the Indian population.

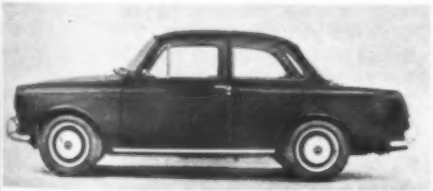
Evidence to support this includes blue-eyed, white-skinned Indians allegedly found among the southern Cherokees. What's more, the language of one tribe was said to be sprinkled with Welsh words.

The question now: will Southern historians, diligently digging into the past, find enough evidence to demand the renaming of October 12th as Madoc Day?—*Robert Gannon*

NOW SEE THIS!

SKYLARK is the name of this 1961 luxury Buick sports coupe. Powered by a 185-hp all-aluminum V8 engine, this highly styled car weighs 1,600 pounds less than conventional size Buicks and hence has one of the highest power-to-weight ratios of any American car. Skylarks are now on view in Buick showrooms.

RENAULT GORDINI is the new high-performance version of the Dauphine. It has a 40-hp engine and a four-speed transmission in place of the conventional three-speed gearbox. Extremely economical to operate, the car set a world's record of 56.5 mpg at the 1960 Italian International Mobil Economy Run. The car's suggested port-of-entry retail price will be $1,645—$260 more than the standard Dauphine.



VOLKSWAGEN'S big brother is the VW-1500, a new two-door sedan designed exclusively for the European market. Six inches longer than the VW and powered by a four-cylinder rear engine, the VW-1500 is conventional in appearance and will sell for about 30 per cent more than the VW. However, it is not for import and won't be available in the U. S.

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By Joseph H. Kraus

INVENTION CLINIC

In this column each month Mr. Kraus will answer as many letter as space permits on those subjects he feels to be of widest gener interest. Time does not allow him to reply to any letters excep those printed here. Address your questions to the Invent Clinic, *Mechanix Illustrated*, 67 West 44 St., New York 36, N.

Reducing Rear End Collisions

Anton J. Netherda, Jr., of Wayne, Neb., has devised a system to reduce drastically the number and severity of rear-end automobile collisions. Although it employs mechanical features it presents nothing new or original but reorganizes present available equipment. Would a copyright of the system improve his chances for marketing?

Not at all because you would be protecting merely your wordage, illustrations or both. Someone else can say the same thing differently, prepare different illustrations and copyright them, too. As you have considerable background experience for your belief in the effectiveness of your system you should discuss the details with a patent attorney. You may discover that you could develop the requirements for a patent.

An Invention Service Bureau

A. Passarotti of North Bergen, N.J., sends information about a patented tool grinding bit. A post card from a "service bureau" i quired about the cash price he expects j the patent and asks if he would consider royalty arrangement. Is this an authen service? Do we think that the tool grindi fixture is worthwhile?

I have no record of this "service bureau Even so, you might tell this outfit that y will consider "X" dollars for outright sale, "Y" per cent royalty with a minimum " dollars annually. Also ask them for re erences. If their reaction is a request for pa ment for listing or other service you will kn that this card was a come-on. Yes, your t does seem worthwhile for special purpo But most lathe operators prefer to grind to while holding with the fingers.

Christmas Tree Lights

L. Gordon Bassett and Jay Drillor of Peo Ill., have designed a light bulb unit to be u on Christmas trees. Is this idea worthy o patent?

There is nothing fundamentally new he Even if it were, I would recommend that y weigh the cost for a set of your lights agai the price you pay for the ordinary set. In bo initial cost and upkeep your design is entir too expensive to be competitive. Finally, you say, you have not yet worked out t switching mechanism. A practical system w quadruple your costs.

Needs Research

Rudolph E. Brau of Kenosha, Wis., says t he has some good ideas but is in no financ position to have models made. How can h sell an idea and have some company do t research?

It is not essential to have a model built win a patent except if the Patent Office as

INVENTOR'S TIP OF THE MONTH

Radios, recorders and dictating machines may not be operated on aircraft because they "radiate signals which cause erroneous readings on navigation equipment." As man-made radiations will continue to increase, it would seem that present aircraft instrumentation needs much improvement or a completely new approach.

for it or you claim something akin to perpetual motion. This also may be true for any attempt to sell an "idea." But as you cannot establish legal ownership to an idea, you will find it difficult to locate a company willing to negotiate for its purchase. This means that you must do the fundamental research or pay others to do it for you. A safe plan is to patent your best idea, then sell it.

Auto Interlock—Anti-Rust Shield

Mrs. S. D. Darling of Lansing, Mich., recommends an interlock for automobiles which will sound an alarm if the car door is opened. She also asks about a shield to prevent rust in the kitchen sink caused by a bottle opener being left there. What kind of a fiber should she use?

Yes, a car manufacturer could build such an interlock. If it became known that a certain make of car had this then any thief could break out the ventilator just as is done now, lower the window, climb in and drive off. But manufacturers don't care if a car is stolen. They sell more cars that way and the insurance covers most of the cost of a new one.

You can use a rubber pad in your sink. Or get yourself a stainless bottle opener. Or attach one to the wall or tie a short string to the present opener so that it can't touch the bottom of the sink.

Battery Disconnect

Roy Briggs of Yucaipa, Calif., has developed a device to disconnect the car battery from a dash control. He feels that this should be useful in case of a short which may occur while driving. It can be made to sell for $10. What chance does he have for a market?

None at all. Anyone can connect a simple relay to the live pole of the storage battery for a lot less money. Except for the heavy lead to the starter, most cars have fuses to protect against shorts.

Vehicle Light

Harold E. McNally of Fort Lauderdale, Fla., sends photographs together with a photocopy of his patent on a vehicle light located in the bottom of a car door. The light turns on when the car door is opened, thus illuminating the ground. What do we suggest as to final disposition—either outright sale or royalty?

As you have correctly surmised, this device cannot very well be produced and sold as an attachment. It needs to be included in the manufacture of the car. I recommend that you

[*Continued on next page*]

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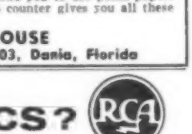

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write a short descriptive letter to every auto manufacturer, both domestic and foreign. State what the invention will do and say that you have a patent and would be willing to discuss its direct or royalty sale. In my opinion the purchaser of a new car would be willing to pay a slight additional charge for this extra value. With a partly red lens you could also provide an additional danger signal. Incidentally, you could have designed this along lines of a do-it-yourself attachment for any car.

Theft-Proof Lock For Autos

Frank Testo of Elkhart, Ind., says that he has a working model of a device which will prevent a car from being stolen. It cannot be jumped or knocked off without automatically locking. An expert mechanic needs three hours to get the car started again. The device could be sold for $10. As he has no money for a patent, what does he do now?

First have a search made to determine if you have something which is patentable. Then get some friend or relative to stake you to the cost of a patent for a share in the invention. But if a mechanic can get the car started in three hours, a thief can do the same. So maybe this is not as "theft-proof" as you claim it to be.

Map Reader

Raymond Ziegele of Lakeland, Fla., sends a design for a map reader especially intended for auto use. He feels it may not be patentable. How can he protect himself so that he can gain some compensation from the idea?

You should first try to learn if you might be able to protect this idea by requesting a search from your attorney. You might also give some thought to a redesign with two feet to give even better results, and perhaps be more economical to produce. If protection is not possible, your best bet for a profit will lie in your ability to produce and market the item yourself. All of these should be worth investigating further. This could be a salable item.

Lint Remover

Mrs. Marian Slaski of Baltimore, Md., telegraphs, and Evelyn Weaves of Mishawaka, Ind., asks by mail about a lint remover. Should it be patented? Would manufacturers be interested?

Only a search would indicate if either or both of these ideas might be patentable. However, nearly everything from a band-covered

bare hand to a plastic block has been exploited for this purpose. We would recommend patent procedures only if you have been assured of a market. And it will be extremely difficult to locate a manufacturer who will be willing to give this assurance.

Egg Separator

Frank K. Isumi of Lahaina, Maui, T. H., sends a diagram and description of a metal device to separate the whites from the yolks of eggs. Is there a similar device on the market?

Yes—and there has been for at least 40 years. It once sold for a dime.

Boat Propulsion System

Everett L. Reisig of St. Joseph, Mich., sends diagrams of a system for propelling a boat without the use of the conventional propeller or paddles. Do we think it would work? How do we suggest he should develop it?

Yes, in our opinion it would work. The question is how well will it work by comparison with the conventional drive. You might make some tests yourself by adapting a small model gasoline engine and setting up your design in a model boat. Then compare the speed which you can attain with that obtained from a similarly designed hull but driven by a regular propeller coupled to the same engine. The results might suggest your next step.

Jet-Powered Ski

Gottfried Mayer of St. Clair Shores, Mich., sends blueprints of jet-propelled skis on which he has applied for a patent. However, he has been advised that a military skier is required to carry 125 pounds of equipment, and that incorporating a device to supply motive power would complicate maneuverability problems.

It makes little difference if a skier is required to carry 75 or 150 pounds so long as he can support the weight. And he is more likely to be able to carry a heavier weight over longer distances and faster with power than without it. But if I were you I wouldn't count too much on the military market. All the armies of the world have a relatively small contingent of ski troops. Also, carrying power skis over terrains where skis cannot be used would pose a logistical problem. I suggest you turn your attention to the potential market comprised of trappers, explorers, sporting enthusiasts, mailmen and rescue teams. I recommend you make a full-scale model of the skis. •

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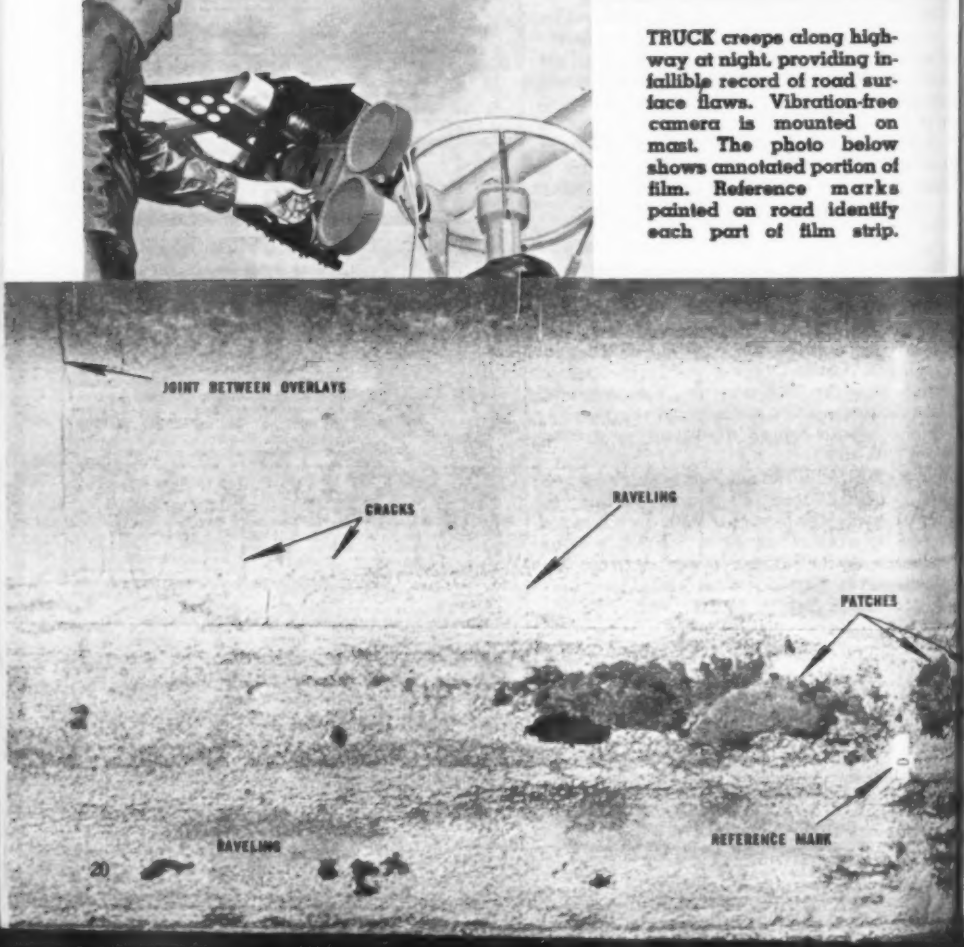

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A recent study of people afflicted with cross-eyes revealed that 73 per cent of them were cured by faithfully following prescribed exercises over long periods.

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The Japanese have built a 15,000,000-volt betatron for the treatment of cancer.

The world's largest salt-water conversion plant is located on the Caribbean Island of Aruba.

Carbon monoxide is an odorless gas. It is present in automobile exhaust fumes but does not give them their characteristic odor. It can cause illness or death even in a room where there is enough oxygen to support life.

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Surgeons have isolated the liver from a dog, kept both dog and liver alive for as long as eight hours with a heart-lung machine and then successfully replanted the liver as part of cancer experiments.

Ice water makes an effective medication for the treatment of burns, according to a recent study.

Drinking lemon juice daily tends to decalcify teeth, cause cavities.

A possible sign of pregnancy: a sudden dislike for the taste or odor of coffee.

In an average year lightning kills 600 people, injures 1,500 and causes more than $125,000,000 worth of property fire loss in the United States.

At least ten to 15 per cent of the heart attacks occuring in the United States do not produce any symptoms.

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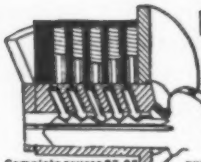

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PATENTS GRANTED

DE-SALTING sea water and converting it to fresh water economically has long been the dream of many men. A new process for achieving this has been developed by Virgil C. Williams of St. Louis, Mo. His idea is to pump carbon dioxide gas under high pressure into precoolers of salt water. The mixture is then sent to a cooling vat where carbon dioxide crystals—which contain trapped (and extractable) fresh water—are formed. Williams has been granted Patent 2,974,102 for his process.

William J. Suller and John M. Fernandez of New Haven, Conn., appalled at the number of "runaway-car" accidents involving cars with automatic transmissions, have developed a device that automatically shifts a car into Park or Neutral when the emergency brake is applied. They were awarded Patent 2,970,-679 for their invention.

A friction brake for doors (DoorBrakes) won Patent 2,872,697 for George Hizsa of Magnolia Machine Works, Elizabeth, N. J. The device screws to the door hinge and holds the door in any desired position. DoorBrakes are already in production and are being sold two for $1.00.

Patent 2,970,539 has been granted J. P. Griffen, St. Paul, Minn., for a symbol printing device. It entails the inking principles of rubber stamps but is specifically designed to print a variety of electronic symbols such as are used in wiring diagrams.

A unique water ski scooter invented by Richard Vogt of Santa Barbara, Calif., has its own motor and attached pair of skis. Granted Patent 2,969,037, the scooter was designed to train novice water skiers.

An apparatus for purifying or softening water has been invented by Kenneth M. Snider, Mansfield, Ohio. Covered by Patent 2,973,097, the self-cleaning device traps foreign matter in pipes of varying widths.

A self-propelled snow and ice vehicle with a high degree of maneuverability won Patent 2,970,662 for Edgar E. Hetteen of Roseau, Minn.

An oil-well rig that can be lifted by helicopter over mountains and other rough terrain won Patent 2,974,760 for inventors Homer J. Woolslayer, Calvin L. Turner and Cecil Jenkins of Tulsa, Okla.

A system (Patent 2,974,441) by which toys can be remotely controlled has been patented by Helmut Denner, Aargau, Switzerland. Toys, such as automobiles, can be made to veer to the left or right or back up, to a child's delight, by a simple command into a microphone. •

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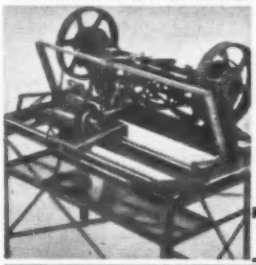

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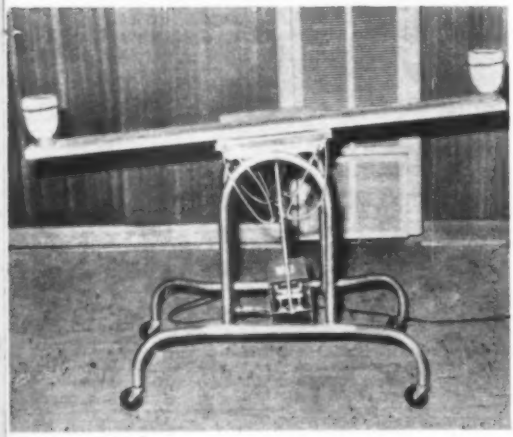
SELF-ROCKING BASSINET

INVENTOR Dudley J. Vincent gazes at his rig—thinking up improvements, perhaps.



PLANK-AND-MILK demonstration shows how smoothly the powered cradle operates.

ROCK-A-BYE BIT has gone automatic for this young citizen, who appears satisfied.

ROCK, rock, rock that bassinet with the Rock-A-Bye electric bassinet rocker—$40 at Nieman Marcus of Dallas, Bullock's of Pasadena and Marshall Field's of Chicago. Having his brainchild on sale in those famous emporiums is the culmination of several years of work for Dudley J. Vincent, Enid, Okla.

Back in '56 Vincent built his first model; since then he has worked to perfect it and now has achieved a noiseless, vibrationless, rhythmic rocking machine that has the endorsement of pediatricians. So smooth is its operation that glasses of milk rocked on it (bottom photo at left) never spill.

The Rock-A-Bye does not rock from side to side, like the old pioneer cradle. Instead it rocks from head to foot, a less disturbing movement. The device is engineered so that the baby's head never dips below the horizontal level.

Constructed of light, aluminum tubing, the rocking machine weighs less than 11 pounds. Vincent saws, bends and drills the tubing in his shop, where he himself assembles the rockers. Self-braced, mounted on non-marking, self-adjustable casters, the device presents an unobtrusive, functional appearance. The 1/250th-hp motor can rock weights up to 150 pounds, making use of the principle of pendulum leverage. The bassinet is easily and safely attached to rocker by springs.—*Calvin Bergdall*

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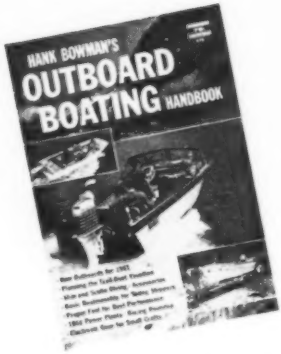

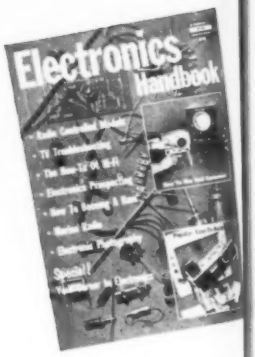

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TV SIGNAL amplifier improves the reception in a valley or fringe area. It can be mounted on antenna mast a mile away with its power supply in the house.

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Whirlpool Corp., St. Joseph, Mich.

HEAVY-DUTY saber saw has angle-lock shoe; blade sets to cut up, down or sideways.

Black & Decker, Towson 4, Md.

Question: WHAT HASN'T THIS CAR GOT?

'49 BUICK incorporates many of the lordly conveniences war vet dreamed up in hospital.

SEBASTIAN CRIMI's Buick has everything aboard including the kitchen sink. During a 12-year stay in the hospital with WW II injuries, the Ft. Lauderdale, Fla. man often daydreamed about a car with every convenience; after he got out he made a hobby of realizing the dream. He plans to add a butane air conditioner. Also hot water—now he has only ice-cooled. Also powerfully-springed safety bumpers. Crimi has many more improvements in mind. •

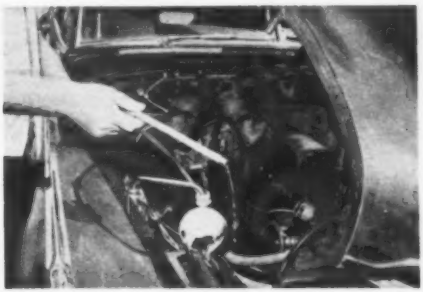
EAR BUTTON radio receiver lets passenger enjoy car radio without disturbing driver.

SHAVER plugs into outlet on dash-mounted converter unit. Note small shaving light.

CIGAR LIGHTER has a good flame—something connoisseurs of fine cigars approve.

TRUNK SINK allows traveler to freshen up on the road. Water tank holds five gallons.

BACK SEAT phone looks great but it's really only an earphone for car radio up front.



WATER for radiator, in case radiator goes dry on the road, comes from water tank.

FUNNEL fits disposal fixture on dash—for emptying ashtrays or carsick kiddies.

RUNNING WATER is available at dash for tooth brushing, hand-washing, drinking.

FOOT BATH in rear. Water drains onto road or can be stored for drainage later.

ROOF VENT takes smoke upward, away from riders' faces. Doors control cartop light.

FIRST AID FOR THE DRIVEWAY

POTHOLES due to oil and gas drips on asphalt are easy to patch with black top.

OUR asphalt driveway, originally a solid beauty of approximately 500 square feet, became an eyesore after heaving caused by the frost of several winters and pothole damage due to oil and gasoline drippings. Yet all it took to make it look new again was an afternoon's work.

Total cost for the job was $25.30. We paid $20.30 for 160 lbs. of black top mix and 10 gallons of black top sealer, both Sakrete products, and five dollars to a scrap metal yard for making up a steel tamper which will be useful for other jobs around the house.

The work, as illustrated, consisted simply of digging out the bad spots, filling them in with the mix and giving the whole drive a coat of sealer. If the job is done on a warm summer day, it isn't even necessary to heat the mix to make it fuse better. We used black sealer, but it can be had in red, green or even white if you want to do a real Hollywood production.—*Jack Marshall*

SOFT SPOTS are first dug out with pick. New material holds best in a jagged hole.

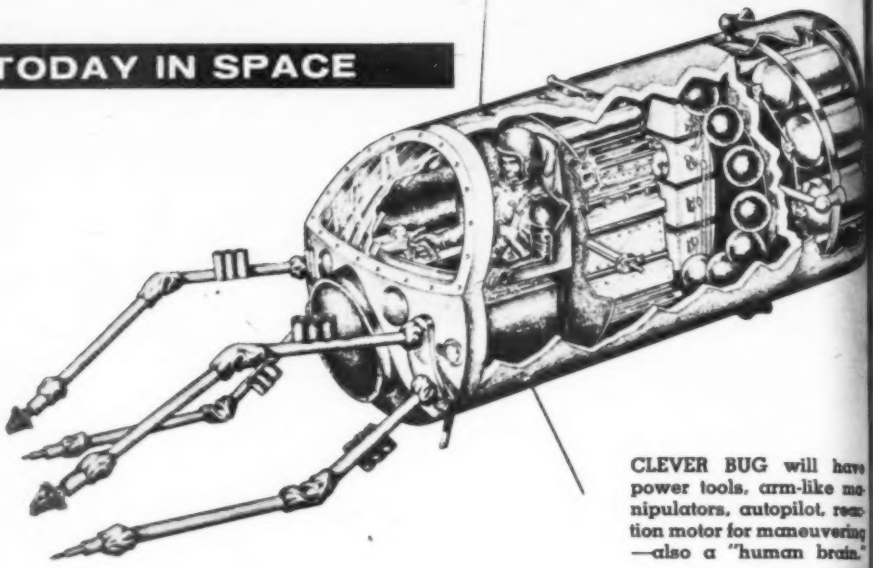
CHARCOAL FIRE provides quick, intense heat to make the black top more pliable.

STRING is stretched taut over a sunken area of the driveway as a leveling guide.

HEAVY METAL tamper was made by a scrap yard for $5. Black top won't stick to it.

SEALER is poured on and spread with a hoe. Work small areas; it thickens fast.

AFTER the sealer is distributed, smooth it out with a broom to complete the job.



CLEVER BUG will have power tools, arm-like manipulators, autopilot, reaction motor for maneuvering —also a "human brain."

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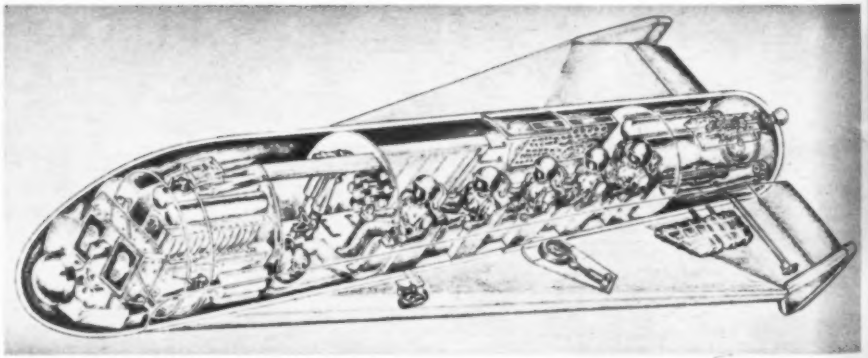

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Netting from $7,000 to $12,000 per year per truck, Mister Softee dealers prove there's big money in small business.

And that business rides 100% on Ford Trucks. Last year alone, Mister Softee, Inc. of Runnemede, New Jersey, equipped and sold over 600 of them to franchised dealers. The key reason: Ford's low-cost dependability. Keeping trucks and freezing equipment in condition actually takes less than 2.5% of dealer income!

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START MAKING money now. Every business a prospect. Solicit delinquent accounts. Instructions free. Top commissions. National Credit, 304B Pickwick Bldg., Kansas City 6, Mo.

WILL YOU wear new suits, sport coats without one penny cost and agree to show them to friends? You can make up to $40.00 in a day even in spare time, without canvassing. Stone-Field, 532 South Throop St., Dept. X-926, Chicago 7, Ill.

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IF YOU'RE interested in making money in selling, see the hundreds of exceptional opportunities in Salesmen's Opportunity Magazine. Send name for your copy, absolutely free. Tell us what you're selling now. Opportunity, 848 N. Dearborn, Dept. 19, Chicago 10, Illinois.

SENSATIONAL NEW longer-burning Light Bulb. Amazing Free Replacement Guarantee—never again buy light bulbs. No competition. Multi-million dollar market yours alone. Make small fortune even spare time. Incredibly quick sales. Free sales kit. Merlite (Bulb Div.), 114 E. 32nd, Dept. C-74F, New York 16.

CALENDARS, NOVELTIES—Full or Part Time. Liberal Commissions. Fleming, 6535-M Cottage Grove, Chicago 37.

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EARN $3 HOURLY, spare, full time, looking up information at your local library. Details free. Service, 81-A. Knickerbocker Station, New York City.

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I WANT A Man who wants a business of his own. I will train you, supply the equipment, help finance you, start you rolling. This is not a risky get-rich-quick scheme. It is a legitimate business, an exclusive protected franchise, proven successful by hundreds throughout the country. Send name, address and phone number to Marion Wade, 2117 North Wayne, Dept. 78M, Chicago 14, Illinois.

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START YOUR Own Business On Credit. Your own boss. 1344 Dealers sold $5,000 to $25,500 in 1960. We supply stocks, equipment on credit. 200 home necessities. Sales experience unnecessary. Pleasant, profitable business backed by world-wide industry. Write Rawleigh's, Dept. F-U-MOM, Freeport, Ill.

MI Classified Advertisements

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EARN $240.00 A Month at home, spare time, doing only two $5.00 Invisible Mending jobs a day. Big money paid for service that makes cuts, tears, disappear from fabrics. Steady demand. Details free. Fabricon, 6256 Broadway, Chicago 40, Ill.

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INVESTIGATE AUTO Accidents — Earn $750 to $1,000 monthly. More investigators urgently needed. Car furnished; business expenses paid. No college education necessary. No selling of any kind. Pick your own job locality. Meet interesting, important people. We train you at home in spare time. You keep present job until ready to switch. Write for Free Booklet. No obligation. Liberty School, Dept. C-105, Libertyville, Illinois.

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FREE PICTURE Folder, "How to Make $3,000 Yearly, Sparetime, Backyard, Raising Earthworms!" Oakhaven-3, Cedar Hill, Texas.

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TREASURE GOLD, Silver, Relics. Find them with new super detectors. Free information. Detectors, Dept. 6-A, North Hollywood, California.

TREASURE! MAP, handbook, 25¢. Locators. Howe, 811C Kansas, Atchison, Kansas.

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1000 BUSINESS CARDS, "Raised Letters" $3.75 postpaid, Samples. Routh, MI-661 2633 Randleman, Greensboro, N. C.

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THREE LINE pocket stamp with pad or office type. $1.00. W. Atherton, Box 61, Randolph, Massachusetts.

FREE RUBBER Stamp Catalog. Martin, 1425C Major Drive, Jefferson City, Missouri.

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25 DIFFERENT LARGE American Commemoratives. 10¢ with approvals. Linstamp, St. Catharines 103, Ontario.

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25 DIFFERENT COMMEMORATIVES 1893 up 10¢. U. S. Approvals, K & B, Box 70, Bklyn 23, N. Y.

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MILLION FOREIGN Stamps! 2¢ each! Send for thrilling, giant approvals! ABC Stamps, Box 6000-HW, San Francisco 1, California.

FREE! "MYSTERY" stamp packet. Approvals. Premiums. Dancer, 875-X16, Mansfield, Ohio.

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USE YOUR sense and save your dollars. Exciting, worthwhile, valuable, free premiums given buyers our foreign approvals. Coast, Box 2187MI, Santa Ana, California.

307 WORLDWIDE DIFFERENT Stamps only 25¢. Approvals. Niagara Stamps, St. Catharines 203, Ontario.

1003 DIFFERENT WORLDWIDE for approval. Buyers Only. Jacobsen, Crompond, New York.

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TRADE YOUR duplicates toward our approvals! (Foreign only.) Complete information, 10¢. Variety Stamps, Box 98-L, Newton Highlands 61, Mass.

FREE—ANY Volume Scott's International Album, Scott's 1961 Catalogues, even Master Global Album Free when you buy our sensational foreign approvals. Bargain Stamps, Redlands, California.

103 DIVERSIFIED BRITISH Empire stamps, 10¢. Approvals. Niagara Stamps, St. Catharines 503, Ontario.

PENNY APPROVALS that will surprise you. Schmidt, Box 1128, Richmond, Calif.

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WOW! COMPLETE Book! Prices we pay for all United States Coins since 1793! Fully Illustrated. 128 Pages. Only $1.00! Also included, Free, our Price List of Coins For Sale! Harry's, Harry Warner, Box 421-L, Mill Valley, California.

TRUNKFULL 25,000 Indian-Lincoln cents mixed (from the 1920's and older). Will pack 'Grab-Bag' style 800 mixed—$50; sample bag of 22—$2. Mrs. Fischer, 5 Centre St., Dept. D, Hempstead, N. Y.

INDIAN PENNIES, 8 Different $1.00. Joseph Gaidar, 6615 South Ashland Avenue, Chicago 36, Illinois.

• • • OLD COINS WANTED

$18,000.00 FOR UNCIRCULATED 1913 Liberty Head Nickel; Dollars—1804-1839, 1893-S, 1895-P, 1903-O $200.00—$15,000.00; Certain Dates—Lincoln Cents $225.00; Indian Cents $1,750.00; Dimes Before 1943—$5,250.00; Quarters Before 1938—$5,250.00; Half Dollars Before 1940—$7,500.00; 2¢ Pieces $1,250.00; Halfdimes—$3,250.00; Hundreds of others worth $10.00-$5,500.00; Certain Gold Coins $40,000.00; Canadian Coins—1921—5¢-$300.00; 1889 Dime—$300.00; 1921—50¢-$2,000.00. Wanted—Large Cents, 20¢ Pieces, Paper Money, etc. Thousands of persons have sold us coins totaling over $250,000.00. For complete information, before sending coins, purchase our Large Illustrated Complete Guaranteed Buying-Selling Catalogue $1.00. Worthycoin Corporation (K-318-C), Boston 8, Massachusetts.

OLD COINS Bought. Illustrated Catalog 25¢. Hutchinson's, Box 4747, Philadelphia 34, Penna.

• • • EDUCATION & INSTRUCTION

ENGINEERING AND Art Degrees earned through home study. Electronics, Electrical, Mechanical, Civil, Physics, Liberal Arts. When writing specify course desired. Pacific International College of Arts & Sciences, primarily a correspondence school. Resident classes also carried. 5719-F Santa Monica Boulevard, Hollywood 38, California.

MI Classified Ads

Your advertisement can reach this mail-buying audience of more than a million readers for only $1.10 per word . . . payable in advance (Check or M.O. please) . . . minimum 10 words. Copy to be inserted in August issue must be in the office June 3. Mail to MECHANIX ILLUSTRATED, 67 West 44th St., NEW York 36, N. Y. Word count: Zone number free. Figure one word: Name of state (New Jersey), name of city (New York); sets of characters as in key (14-D); also abbreviations as 35mm, 8x10, D.C., A.C.

SAVE MONEY • ORDER BY MAIL

• • • AGENTS WANTED

NEW! EARN Hundreds Of Dollars representing amazing new kind of shoes, Beaver Shoes, made of Everon, look and feel like leather, wear 4 times longer! Moulded in one piece—no seams to rip. Never need polishing or waxing. Clean with wet cloth or throw in washer. Not rubber, can't burn feet, always cool, comfortable. Styles for the whole family. Retail $1.69 to $4.99, you make big profits. Get exciting details plus Half Price offer of shoes for yourself. Beaver Shoes, Beaver Meadows 7, Pa.

YOUR FREE copy of World's biggest sales magazine tells you how and where to make more money on your own in selling. Specialty Salesman Magazine, Desk 7B, 307 North Michigan, Chicago 1.

PRINTING, ADVERTISING Salesmen—Excellent moneymaking sideline selling Decalcomania Name Plates, small quantities. Automobile initials. Sign Letters. Free Samples, "Ralco," XL, Boston 19, Mass.

MAKE $55 A Day clear profit! Sell nationally advertised Royaltone Auto Glaze to car owners, dealers, jobbers. Exclusive territories. Rush name for free sample, details. Royaltone, Inc., Brooklyn 30, N. Y.

YOUR OWN business—Suits $1.50; Overcoats 65¢; Mackinaws 35¢; Shoes 12½¢; Ladies' Coats 30¢; Dresses 15¢. Enormous profits. Catalog Free. Nathan Portnoy Assoc., 2109-M Roosevelt Rd., Chicago 8, Ill.

SELL CHAMPION, AC, Autolite spark plugs. Reconditioned, electroplated, guaranteed 10,000 miles. 100% profit. Free sample. Lee Spark Plug Co., 1608-M Roberts, Houston 3, Texas.

PORTABLE TRANSISTOR tape recorder. Nothing like this on market at such low cost. Write now or send $28.00 for demonstrator. Universal Sales, P. O. Box 3103, St. Louis 5, Mo.

SEEKING NEW Products? Get my outfit 47 money-making specialties. Latest conveniences for home, car. Send no money. Just your name. Kristee 45, Akron, Ohio.

EVERY MAN A Prospect. Refundable sales kit offer showing line belt buckles, tie clasps, money clips, cuff links, lapels, identification badges, individualized with customer's name and emblems. Cap badges for trucking bus, taxi, police, firemen, also heavy construction emblems. Choice 3000 emblems. Hook-Fast, Box 1088MI, Providence, R. I.

WHOLESALE MAGAZINE Subscriptions. — Highest Commissions — Bonus. Qualified Magagencies, 4518D Kingston, Brooklyn 25, N. Y.

SELL GREETING Cards — Make extra money. Christmas, All Occasion assortments, Stationery, Costume Jewelry, Gifts, Personalized Christmas Cards. Experience unnecessary. Write for Salable Samples on approval details. HEDENKAMP, 361 Broadway, Dept. MI-51, New York.

MEN-WOMEN AGENTS: Sensational new moneymakers—Beautifully hand-painted plastic personalized photo enlargements, compacts, rings, bracelets, lockets, etc. Simply take orders, pocket 40% commission—we deliver and collect. Sales outfit free. Novelco, 3343 North Avenue, Chicago 47.

FREE! BEAUTIFUL Mexican Curios! Send 14¢ stamps mailing. Sylviam, Apartado 9036, Mexico City.

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EARN BIG Commission Full Or Part Time. Build protitable business of your own selling America's largest line low priced business printing. 360 page catalog samples hundred of items used daily by business people. Imprinted ball pens low as $8.95 for 100. Big full color catalog low priced advertising specialties included. Free sales kit. National Press, Dept. 7, North Chicago, Illinois.

START MAKING money now. Every business a prospect. Solicit delinquent accounts. Instructions free. Top commissions. National Credit, 304B Pickwick Bldg., Kansas City 6, Mo.

WILL YOU wear new suits, sport coats without one penny cost and agree to show them to friends? You can make up to $40.00 in a day even in spare time, without canvassing. Stone-Field, 532 South Throop St., Dept. X-926, Chicago 7, Ill.

MAKE EXTRA Money—Big Cash Commissions plus premiums for you and your customers. Sell Advertising Book Matches—sensational new Tenorama, Glamour Girls, Hillbillies; dozens others. All sizes—Quick daily sales; big repeat business. Free Master Kit makes selling easy—no experience necessary. Superior Match, Dept. F661, 7530 Greenwood, Chicago 19.

MAKE UP to $50.00 a day soliciting delinquent accounts. Terrific commissions. Write today. General Finance, 304W Pickwick Bldg., Kansas City 6, Mo.

IF YOU'RE interested in making money in selling, see the hundreds of exceptional opportunities in Salesmen's Opportunity Magazine. Send name for your copy, absolutely free. Tell us what you're selling now. Opportunity, 848 N. Dearborn, Dept. 19, Chicago 10, Illinois.

SENSATIONAL NEW longer-burning Light Bulb. Amazing Free Replacement Guarantee—never again buy light bulbs. No competition. Multi-million dollar market yours alone. Make small fortune even spare time. Incredibly quick sales. Free sales kit. Merlite (Bulb Div.), 114 E. 32nd, Dept. C-74F, New York 16.

CALENDARS, NOVELTIES—Full or Part Time. Liberal Commissions. Fleming, 6535-M Cottage Grove, Chicago 37.

• • • BUSINESS OPPORTUNITIES

EARN $3 HOURLY, spare, full time, looking up information at your local library. Details free. Service, 81-A. Knickerbocker Station, New York City.

FREE! NAME Brands Catalog! Your own high profit business. Sell Name Brands full or part time. No inventory—no investment. More than 2000 Name Brand items; lowest wholesale prices. Watches, jewelry, cameras, hi-fi, stereo, radios, phonos., appliances, housewares, hardware, power tools, luggage, musical instruments, garden equipment, sporting goods, toys, many others. 8 Floors of Name Brands. Million dollar inventory. Orders shipped complete within 24 hours. Send for Free beautifully illustrated catalog Now! Separate wholesale price list. H. B. Davis Corp., Dept. MI, 145 West 45th St., New York 16, N. Y.

I WANT A Man who wants a business of his own. I will train you, supply the equipment, help finance you, start you rolling. This is not a risky get-rich-quick scheme. It is a legitimate business, an exclusive protected franchise, proven successful by hundreds throughout the country. Send name, address and phone number to Marion Wade, 2117 Madison, Wayne, Dept. 78M, Chicago 14, Illinois.

LEARN PROFESSIONAL TV Servicing in one week! Fabulous new simplified system. No big expense. No studying, no tools or equipment. Spare, full time. Own your own big profit business! Save! Amazing but true! Free! Write, TV System, Dept. EC-156, 1038 So. LaBrae, Los Angeles 19, Calif.

$250.00 WEEK SPARE time profit possible. Earn at home with new fascinating Printing method. $5 starts you—send for money now. Free Confidential Facts and Valuable sample. Screen-Print, JE, Los Angeles 61.

FREE REPORT: "609 Odd, Successful Businesses." Box 1001-MIT, Evanston, Ill.

IMPORT-EXPORT OPPORTUNITY, profitable, world-wide mail-order business from home without capital; or travel abroad. Established world trader shows instructions for no-risk examination. Experience unnecessary. Free details. Mellinger, Dept. T756, Los Angeles 16, Calif.

VENDING MACHINES—No selling. Operate a route of coin machines and earn amazing profits. 32-page catalog Free! Parkway Machine Corporation, Dept. 2, 715 Ensor St., Baltimore 2, Md.

INCREDIBLE NEW "Table-Top" Machine manufactures over 15,000 saleable products. Also laminates, encases, moulds plates in bronze, chrome, or copper in 30 seconds. 20¢ materials produce $5 products. Free Confidential Details. Home Business Plan. Plasti-Form, Dept. MI-6, Gardena, Calif.

$3.00 HOUR—HOME, sparetime, assembling pump lamps. Easy. Free Details. Ougor, Caldwell, Arkansas.

MARKETS EVERYWHERE. Make Art concrete birdbaths, pottery. Best selling. Home workshop. Hundred varieties. Free pictures. Hollywood Cementcraft, 8527-E Wonderland, Hollywood 46, California.

GROW ORCHIDS At Home. Profitable, fascinating. Successful Home grower explains special light, temperature and humidity conditions Orchids need. Free—full details plus 3-month subscription to "Orchidian" magazine. Orchids, 100 S. Vermont, Los Angeles 4.

FREE PICTURE Folder, "How to Make $3,000 Yearly, Sparetime, Backyard, Raising Earthworms!" Oakhaven-45, Cedar Hill, Texas.

11,000 NEW PROSPECTS Daily. Baby record books, shoes, albums. Sell mail-order. Use our literature. Write: No-Co-Ro, Capitola 16, Calif.

BRONZE BABY Shoes: Instructions, Equipment and Mountings for genuine Electroplating Process. Largest Supplier of all Plating Equipment, Supplies. Free Catalog. Hollywood Bronze Supply, Dept. B-5, 1624 East First, Los Angeles 33, Calif.

$1.00 BRINGS YOU $18.00 Spare-Full Time Home-Business opportunity! Amazing new velvet-spray transforms old ####s lamps, TV-radios, figurines, furniture—anything—into $$$$$ products! Free samples, 50 Business Opportunities Booklet. Send No Money. Flok-Kraft JE, Los Angeles 61.

MONEYMAKING FRANCHISE can be exclusively yours. For free current franchise reviews information write Franchise Newsletter, H, 9 South Clinton, Chicago 6.

WANT TO Make Big Money At Home? $10.00 profit in an hour possible with Invisible Mending. Make tears, holes disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details Free. Fabricon, 6254 Broadway, Chicago 40, Ill.

YOUR OWN Bible Business. Exclusive Protestant, Catholic Illustrated, Family-size editions. Margareta's, Box 92, Hazleton, Pa.

MAKE DURABLE building plastic easily. Waterproof, Fireproof, Economical. Rays Laboratory, Chinle, Arizona.

START RUBBER Stamp Business at home, spare time without experience. Catalog Presses, Materials information Free. Custom Manufacturers, 507 N. Jefferson, Springfield 3, Mo.

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BUY DIRECT from factories. Appliances, cameras, watches! Free details! Cam Co., 6810MI-20th Ave., Brooklyn 4, N. Y.

$70 WEEKLY—HOME, spare time. Simplified mail bookkeeping. Immediate income—easy! Auditax, 34757E, Los Angeles 34.

EXCEPTIONALLY PROFITABLE opportunity in Tape Recording! Free Information. Baron's, Lynden, Washington.

LIQUID MOLDING Rubber, Free Sample. Shellcraft Supplies. Chaney, 1907-B East Road, Jacksonville 11, Fla.

COLORGLAZED CONCRETE pottery made without molds. Patented method. Cemetery products, novelties, files. Basement leaksealing. Moneymaking projects. Booklets, details free. Men only. National Pottery, Grand Rapids, Minnesota.

GROW MUSHROOMS. Cellar, shed and outdoors. Spare, full time, year round. We pay $4.50 lb. dried. We have 29,000 customers. Free Book. Mushrooms, Dept. 183, 2954 Admiral Way, Seattle, Wash.

PIANO TUNING learned at home quickly. Tremendous field! Musical knowledge unnecessary. Be independent! Information free. Empire School of Piano Tuning, Champaign, Ill. (Founded 1935).

BAKE NEW Greaseless Doughnuts In Kitchen. Sell stores. Free recipes. Irving, 3605 South 15th, Minneapolis 7, Minnesota.

MINK RAISING information free. Complete. Lake Superior Mink Farm, Superior, E. E., Wisconsin.

OPPORTUNITY TO earn $15,000-$30,000 annually. Franchise protected. Granted on $12,500 basis. Live at home. No merchandise to buy. Selfemployed. One of most exclusive and noncompetitive Businesses in United States and Canada. Send for free explanatory booklet. Harrell & Company, Box 8-F, Louisville, Ill.

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RE-CAST JUNK batteries into new. Latest achievements. Battery Laboratories, Bayou LaBatre, Alabama.

CASH FROM Sawdust, Tin-Cans, Newspapers. Over 200 methods. Instructions $1.00. Charles Company, 42-EPH, Norwood, Ohio.

FRANCHISES MAKE Profits! Have your own prosperous franchise business. Opportunities nationwide for distributors, dealers, agency operators. Write today. National Franchise Reports, MI-528, 333 North Michigan, Chicago 1.

IMMEDIATE PROFITS with no capital or experience. Take orders for all magazine subscriptions. Friends and neighbors are your prospects. Write now for complete, free kit. McGregor Magazine Agency, Dept. 212B, Mount Morris, Illinois.

LEARN SEWING Machine Repairing. To $125 weekly. Sparetime. Supplies. Add to present business. Write today! Taylor Service, Box 2126, San Bernardino, Calif.

RECEIVE—IMPORT Catalogs! Circulars! Foreign Offers; Get Listed—$.25. Importico, Dept. D, Enka, North Carolina.

WANTED: HOME producers, to be subcontractors. Cast plastic products for manufacturers in our Clearing House Service. Thousands of easily-made items required. Cash in at home, without previous experience. Plastic Service Associates, Dept. 6-MI, East Boston 28, Mass.

I RETIRED at 47, simple plan—home! Free "Profits 1935-1968." Free book "711 Bizarre, Successful Ventures." Haylings-M17, Carlsbad, Calif.

REPAIR HYDRAULIC jacks—easy and profitable. Details free. Write: Hydraulics, Box 4104, El Paso, Texas.

MAKE $46 FROM Square Foot Plywood; Jigsaw necessary. Free Details. Woodet, Bridgewater, Mass.

LEARN WATCH Cleaning, Repairing, Illustrated. Excellent Earnings. Kester, Deckerville, Michigan.

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MAILORDER DEALERS, Beginners, Jobbers, Hobbyists, extra income. Details: Sterling, Box 626-MI, Dania, Florida.

TEN STEPS To Riches . . . Yes! Just ten. Others have taken these steps, why not you? Details 50 cents. Credited on your order. Box 781 L, Brisbane, Australia.

FREE BOOK "990 Successful, Little-Known Businesses." Work home! Plymouth -46R, Brooklyn 4, New York.

WIN CONTESTS! Secrets Revealed! Free Information. Box 51-MCA, Des Plaines, Ill.

NATIONAL MAILORDER Magazine! Successful Home Business Opportunities, Bargains. Lifetime repeat income. Copy 50¢. Crestwood Sales, 6420-A So. Ashland, Chicago 36, Illinois.

MONEY MAKING Acme Saw and Lawnmower Sharpeners. Finest made. Easiest and most profitable to operate. Thousands of satisfied users. Terms. Free literature. Made and guaranteed by Max Manufacturing Co., 138 Stockton Ave., San Jose 26, California.

BIG PROFIT! Learn to operate auto and iron salvage yard. Box 806, Mason City, Iowa.

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FOREIGN EMPLOYMENT Information. Work overseas. Travel, adventure. Europe, Africa, Asia, Canada, Alaska. Earn as much as $1,600 monthly. Construction men, truck drivers, clerks, teachers, professionals, etc. Fabulous opportunities. Most complete information, application forms, etc. Sent by return mail same day received. Send $2.00 to Dept. M, Foreign Bureau, P. O. Box 512, New Orleans, Louisiana.

FOREIGN JOBS—Latin America, Alaska, Canada, up to $1500 monthly. Up-to-date 1961 Foreign Service Directory gives complete information; hot list of firms hiring for Military and Civilian Construction, Aircraft, Oil, Exporters-Importers, Mining. How-When-Where to apply. 13th successful year. $1.00. Global Reports, P. O. Box 5201, MI, Inglewood, Calif.

MAKE EXTRA Money selling advertising matchbooks. Free catalog and sales outfit. Matchcorp, Dept. MI-61, Chicago 32.

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MAKE EXTRA Money—Big Cash Commissions plus premiums for you and your customers. Sell Advertising Book Matches —sensational new Tenorama, Glamour Girls, Hillbillies; dozens others. All sizes —Quick daily sales; big repeat business. Free Master Kit makes selling easy—no experience necessary. Superior Match, Dept. FX-661, Greenwood, Chicago 19.

MEN-WOMEN! START Money-Making Plastic Laminating Business at home in spare time. Material that costs 11¢ brings back $2.58. No canvassing or selling but mail orders bring in $20 a day. Write for full particulars Free. Rush name on postcard to Warner, Room CL-4-D, 1512 Jarvis, Chicago 26, Ill.

$25-$50 WEEKLY POSSIBLE, re-writing news items, Jokes, Poems, Recipes for publishers. Some worth $10 each. Details Free. Service, BI-B, Knickerbocker Station, New York City.

START YOUR Own Business On Credit. Your own boss. 1344 Dealers sold $5,000 to $25,500 in 1960. We supply stocks, equipment on credit. 200 home necessities. Sales experience unnecessary. Pleasant, profitable business backed by world-wide industry. Write Rawleigh's, Dept. F-U-MOM, Freeport, Ill.

MI Classified Advertisements

FABULOUS FRANCHISE Profits Available. For current franchise review information, write Franchise Newsletter, H3, 9 South Clinton, Chicago 6.

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EARN $240.00 A Month at home, spare time, doing only two $5.00 Invisible Mending jobs a day. Big money paid for service that makes cuts, tears, disappear from fabrics. Steady demand. Details free. Fabricon, 6256 Broadway, Chicago 40, Ill.

BUSINESS OF your own. Earning potential as high as $40,000 annually. Issued on $12,500 base. No merchandise to buy. Send for free explanatory booklet. Harrell & Company, Box 8-FF, Louisville, Ill.

MAIL LETTERS Featuring Real Merchandise—Get $10 orders in every mail—$8 profit. Everything furnished. Write: The Mailerette, 1502 South Lowell, Santa Ana, California.

BECOME INDEPENDENT with your own franchise business. Thousands earning handsome incomes. Request interesting facts today. National Franchise Reports, MX-528, 333 North Michigan, Chicago 1.

MAKE MONEY Clipping Newspaper Articles. Certain newsclipping information worth $10.00 each. Bonco, 130 Cumberland, Masontown, Pa.

A SECOND income from oil can end your toil! Free book and oilfield maps! National Petroleum, PanAmerican Bank Building-MI, Miami 32, Fla.

EASY TO start Rubber Stamp business at home in spare time. Make up to $9.80 an hour without experience. Facts Free. Write Roberts, 1512 Jarvis, Room CR-4-D, Chicago 26.

LARGE AFRICAN Nightcrawlers! 100—$2.00, 500—$7.00, 1000—$12.50, Postpaid. (Dealers wanted) Ozark Worm Farm-4, Willow Springs, Missouri.

MEN!-WOMEN! MAKE money raising bait at home. Easy! Sell your crop to us. Send postcard for free photos! Red Wigglers, Warsaw 8, Indiana.

PUZZLE CONTESTS, books, assistance, news! Spence, Box 11569, St. Petersburg, Fla.

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INVESTIGATE AUTO Accidents — Earn $750 to $1,000 monthly. More investigators urgently needed. Car furnished; business expenses paid. No college education necessary. No selling of any kind. Pick your own job locality. Meet interesting, important people. We train you at home in spare time. You keep present job until ready to switch. Write for Free Booklet. No obligation. Liberty School, Dept. C-105, Libertyville, Illinois.

VENDING MACHINES—No selling. Operate a route of coin machines and earn amazing profits. 32-page catalog Free! Parkway Machine Corporation, Dept. 16, 715 Ensor St., Baltimore 2, Md.

FREE PICTURE Folder, "How to Make $3,000 Yearly, Sparetime, Backyard, Raising Earthworms!" Oakhaven-3, Cedar Hill, Texas.

PROFITABLE FRANCHISE can be yours exclusively. For latest franchise review information write Franchise Newsletter, H-2, 9 South Clinton, Chicago 6.

$5,000 FROM HALF Acre growing Ginseng, crop bought. Particulars 10c. Associated Growers, Sperling, Manitoba.

COMPLETE SUPPLY House For Sewer Cleaners And Sanitary Truck Operators. Training available. Write for catalog. Grove Machine Works, Box 306M, Fremont, Ohio.

PIANO TUNING learned quickly at home. American School of Tuning, Box 707, Gilroy, California.

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NEW DELUXE Multicolor below wholesale catalog, automobile catalog, and others. Housewares, appliances, refrigerators, freezers, washers, dryers, television, radios, furniture, clothing, luggage, binoculars, phonographs, recorders, cameras, projectors, tools, typewriters, watches, jewelry. Name brands. Huge discounts to 70%. Postcard: Selbyco, Decatur 17, Illinois.

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WHOLESALE CATALOG of nationally advertised brands with liberal postage allowance. $1.00 refunded first order. Ralph Gibbons, 245 First Avenue South, Shelby, Montana.

WORLD'S LARGEST wholesale supply. Buy from 269 American, European, Japanese wholesalers. Tailormade suits from Hongkong. 123 Dropship catalogs. Rockbottom prices. Free details. International Buyers, 216-MI Jackson, Chicago 4, Illinois.

100,000 PRODUCTS WHOLESALE! Terrific Bargains! United Wholesalers, 1265-X Broadway, New York 1, N. Y.

TRUE WHOLESALE Catalog. Hundreds of Name Brand Items. Invest $1.00 (Refunded with first order). Simco Enterprises, Box 485, Mendenhall, Mississippi.

IMPORT CLOTHING Direct From Tailor. Save 50% or more. Full details $1.00. Lloyd & Company, Box 581, Joplin, Missouri.

ELECTRIC GUITARS, Amplifiers, wholesale, free catalog. Carvin MIW, Covina, Calif.

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GOVERNMENT SURPLUS—Jeeps, $264.00; Radios, $2.53; Boats, $36.00; Guns, Airplanes; Walkie Talkies; Typewriters; Cameras; Tools; Thousands of items. Buy direct from government at ridiculously low surplus prices. Full details and procedure all yours complete by return mail, only $1.00. Surplus Bargains, Dept. M, P. O. Box 512, New Orleans, La.

JEEPS — $223.85, TYPEWRITERS — $7.15, Boats — $7.50, Autos — $38.53, Tires — $1.33, Generators — $1.08, Tools, Tents, Radios, Ammunition. Typical surplus prices. Buy direct. List of depots, procedure, full details only $1.00. N. Y. Enterprises, International Airport, Box 402-H17, New York City.

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GOOD INCOME from home typing—17 proven ways! Detailed information $1. Satisfaction guaranteed. Ryco Service, 210-D Fifth Ave., Suite 1102, New York 10.

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CANDLEMAKING & DECORATING. Terrific Hobby, Great Bu$ine$$, Learn fascinating molding, dipping, creating & decorating candles for year-'round demand — holidays, birthdays, weddings, anniversaries, All Events. Spare time fun & extra income now, expand to colorful candle shop later. No age limit. Write for Free Facts on Home Instruction Method. Candle Institute, Dept. X-432, Fallbrook, Calif.

LADIES: EARN up to $2.00 hour sewing babywear! No house selling! Send postcard to Cuties, Warsaw 58, Indiana.

HOME TYPING! $65 week possible. Details $1. Treasury, 709 Webster, New Rochelle MI-6, N. Y.

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EXPERIMENTERS: NEW! Bigger Catalog and "Experiments Booklet." Only—25¢. Hagenow Laboratories, Manitowoc, Wisconsin.

232 PAGE CATALOG $2.00 Laboratory Materials, 7319 Vincennes, Chicago, Ill.

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EXCLUSIVE MANUFACTURING Formulas and Processes. List Free. Moon, Martville, N. Y.

FORMULAS. ALL Kinds. Amazing Big Catalog 10¢. Kemistry, Park Ridge, Illinois.

• • • EMPLOYMENT INFORMATION

DIRECTORY REPORTS. Construction, aviation, shipping, oilfields, government, manufacturing, trucking, etc. Foreign-Stateside. Helpful information plus jobgetting tips on preparing application letters. Unconditional money-back guarantee of satisfaction. Act Today. Only $2.00. ($2.25 Airmail) (C.O.D.'s Accepted) Research Services, Meramec Building, St. Louis 5-MI, Missouri.

CHOICE U. S. & Overseas Jobs. All Trades. Firms, Addresses, Hiring Procedures, Pay Scales, Benefits. For info. write: World Wide, Dept. F6, 149 N. Franklin St., Hempstead, N. Y.

FOREIGN EMPLOYMENT. Construction and other work projects. If interested in overseas work with good pay, write Foreign Service Bureau, Dept. MI, Bradenton Beach, Florida.

"THE GREAT Northwest," Alaska Oregon Washington, Jobs, Business Opportunities classifieds airmailed. $2.00. Tri-State Service, Box 2158, Vancouver, Washington.

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POWERFUL M-SCOPE locates buried treasure, coins, silverware, relics. Used by experienced explorers since 1952. Transistorized, supersensitive, lightweight. From $59.50; terms. Free illustrated booklet, fascinating customer experiences. Fisher Research, Dept. CI, Palo Alto, Calif.

TRANSISTOR TREASURE Detectors, underwater detectors. Many models. Free catalog. Gardiner Electronics Co., Dept. 3, 2545 East Indian School, Phoenix, Ariz.

TREASURE GOLD, Silver, Relics. Find them with new super detectors. Free information. Detectors, Dept. 6-A, North Hollywood, California.

TREASURE! MAP, handbook, 25¢. Locators. Howe, 811C Kansas, Atchison, Kansas.

Classified Advertisements MI

• • • PRINTING, MULTIGRAPHING, MIMEOGRAPHING

BUSINESS CARDS Raised Letters $3.00 per 1,000, like engraved. Free samples. Kavanagh, 407 Knickerbocker Ave., Brooklyn 21, N. Y.

LETTERHEADS: 500—$4.50. FREE Sample. Carlayne Company, 1803 Fremont, Rapid City, South Dakota.

1000 BUSINESS CARDS, "Raised Letters" $3.75 postpaid, Samples. Routh, MI-661 2633 Randleman, Greensboro, N. C.

1,000 BUSINESS CARDS, "Raised Letters" $3.95. Samples. Pioneer, MI-6, Island Park, N. Y.

• • • PRINTING OUTFITS & SUPPLIES

PRINTING OUTFITS, type, supplies. Send dime for illustrated supply book and samples. Kelsey, Inc., H-57, Meriden, Conn.

MAKE YOUR Own self-molding rubber stamps and printing cuts. Plexirubber, Argyle 3, Wisconsin.

RUBBER STAMP Presses, Supplies. Kiewiet, 2025 Barney Road, Kalamazoo, Michigan.

• • • RUBBER STAMPS & MARKING DEVICES

THREE LINE pocket stamp with pad or office type. $1.00. W. Atherton, Box 61, Randolph, Massachusetts.

FREE RUBBER Stamp Catalog. Martin, 1425C Major Drive, Jefferson City, Missouri.

3 LINE STAMP 50¢, Catalog 10¢. Fleetline, Box 344G, Hinckley, Ohio.

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STAMP JUNGLE including Zabu, Kookaburra, Koalabear, Kangaroo, Rhinoceros, 10¢. Approvals. Crown Stamp Company, Virgil 303, Ontario.

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SECRET MAIL Address. $3 Month. Hedgpeth, Box 830, Alhambra 17, California.

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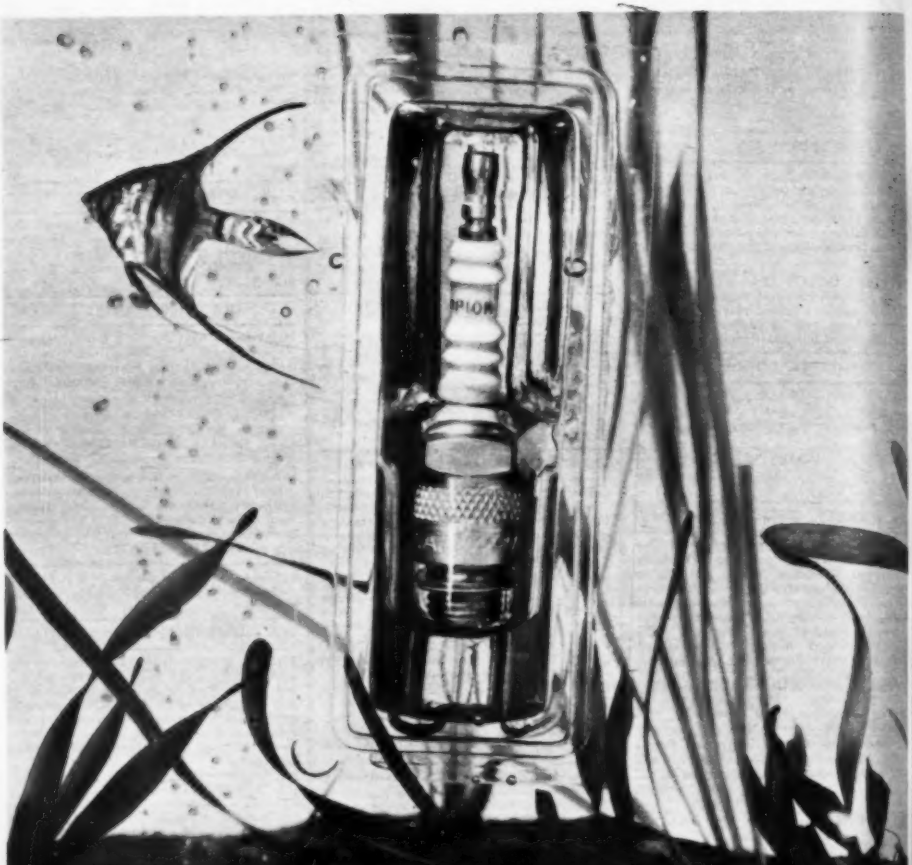

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WATERPROOF PACK KEEPS YOUR SPARE CHAMPIONS CLEAN AND DRY–ALWAYS!

That's just one reason for making Champions your choice for spare—as well as "in use"—spark plugs. Other reasons? Champion's rust-resistant plating. The attached gasket that never falls off. Champion's winning performance. All this—at no extra cost! No wonder every major outboard maker uses Champions. So always carry spare Champion spark plugs.

CHAMPION

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MAIL FOR McCAHILL

UNCLE TOM ANSWERS HIS MOST INTERESTING LETTERS IN THIS COLUMN. WRITE TO HIM AT *MECHANIX ILLUSTRATED*, 67 WEST 44TH ST., NEW YORK 36, N. Y.

● *I read in the paper the other night where a woman was stopped for not having a license plate on her car. She quickly produced one from her glove compartment. When the cop asked her why it wasn't on the car, she answered it was such a horrible color she couldn't stand to see it ruining her pretty paint job. It cost her ten bucks in court. Try and top that!*

Edgar A. Towne
Denver, Colo.

Can't say I'd blame her much if she lived in Florida, for example, where the license plate colors seem to have been selected by a seasick chameleon.

● *Do you think Kennedy will give us better highways than the Republicans did?*

Frank Fletcher
Hartford, Conn.

Give us! Where the hell were you when the Tax Collector passed the hat? We've already paid enough dough to build eight lanes to the moon. Kennedy can't even make it to Boston without a detour.

● *What has happened to touring? Did it disappear with the carrier pigeon? Years ago thousands of American families went touring on their vacations, just traveling wherever their moods took them from day to day. It was a great American custom. Today, everyone I know has given up touring for fast trips to Florida or some other spot, and the object seems to be to get there just as fast as they can with the fewest stopovers. I feel they are missing a lot, and next summer my family and I are planning to take a good old-fashioned tour with no particular destination in mind.*

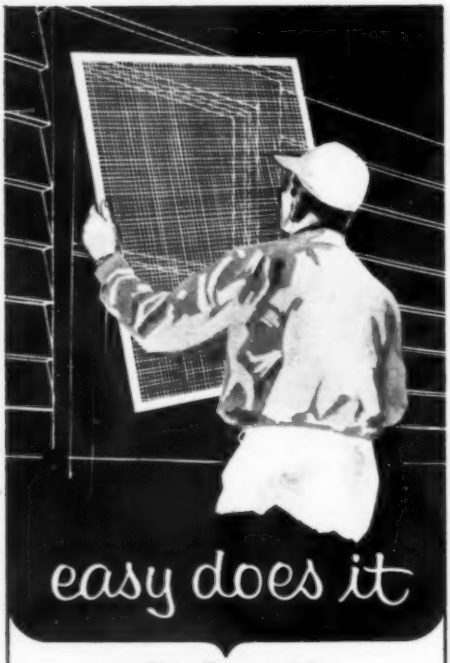
John F. Coleman
Stamford, Conn.

You're right, John. Touring is a lost art. Today, as you point out, the object is to get from good old Point A to Point B in the least possible time—which brings up something I've had in mind for many years. Having actually toured through nearly every country in the world where they have roads, let me say that nowhere can a man see more for less dough than on a coast-to-coast trip right here in the United States. Here's a touring thought for the reader whose business doesn't take him around as much as mine does. For the man with a typical two-week vacation which usually starts on a Friday night and ends two Mondays later, it is possible—without too much effort, believe me—to go to and return from just about any part of the continental United States by car.

To make it tough, let's suppose our reader lives in New York. (If he lived in Chicago, St. Louis or some other city in the midwest, it would be that much easier.) Our New York boy's vacation starts on a Friday night. Early the next morning he heads for the Jersey Turnpike and west. Neither he nor any of his family has ever been much west of Newark. The further west he goes, the more miles per day he finds he can travel without pooping himself. In other words, if this family has the marrow of a canary, they won't have to break any speed records at all or have anyone get exhausted in order to pull into Hollywood, Calif. on the following Friday night. The entire weekend can be spent in Hollywood, if that's what they want, or some other part of southern California. Three days later, on Monday morning, they can start east again via a very different route, with plenty of time to spare for looks at the Grand Canyon. And Junior can *see* the prairies and plains where his favorite TV western shows allegedly were made.

The point is that between California and New York on just about any route you'll see the most fabulous array of different types of scenery—absolutely unimaginable if you've never seen it. It will be a terrific education not only for the kids but for yourself as well, an experience you'll never forget. You'll see

[*Continued on next page*]



with Reynolds

Do-It-Yourself Aluminum

Springtime . . . and the lady of the house wants new screens for home or summer cottage. What easier way than to "do-it-yourself" . . . with Reynolds Aluminum, of course! Window size or type is no problem; casement, awning, or regular windows of any size and shape are easily screened to individual measure. And there's no elaborate manufacturing process! With Reynolds Aluminum materials, your screens are practically ready to assemble. Everything you need is available at your nearby hardware or building supply dealer. Pick up the free instruction booklet with its "how-to" project sheets; purchase the Reynolds Aluminum screen materials you need and then "do-it-yourself". . . with Reynolds Aluminum.

Reynolds Metals Company

Richmond 18, Virginia

Mail For McCahill

[*Continued from page* 43]

everything from snow-capped mountain peaks to scorching desert, the vast plains and mountain passes. And the chances are it will cost you less than renting some tumbledown shack at the seacoast for a lousy, damp two weeks. Many Americans are getting like spawning fish, going back to the same third-rate place year after year.

I'll guarantee you one thing—the quickest way to sweep your mind of the petty problems of home and office is a trip across the country. You shutins ought to try it. A man, his wife and two kids could pull off the whole trip for less than $500, providing they have a car in top shape to start with.

● *My wife told me this morning I'm not "sexy." What's your definition of "sexy,"*

P.L.H.
Louisville, Ky.

If your wife wasn't right, you wouldn't be asking.

● *I have an absolutely unused rear axle assembly for a 1928 Franklin which I inherited as part of my uncle's estate. Should this be included in the estate's appraisal?*

Ben T. Forbes
Pontiac, Mich.

Sure, send them a bill.

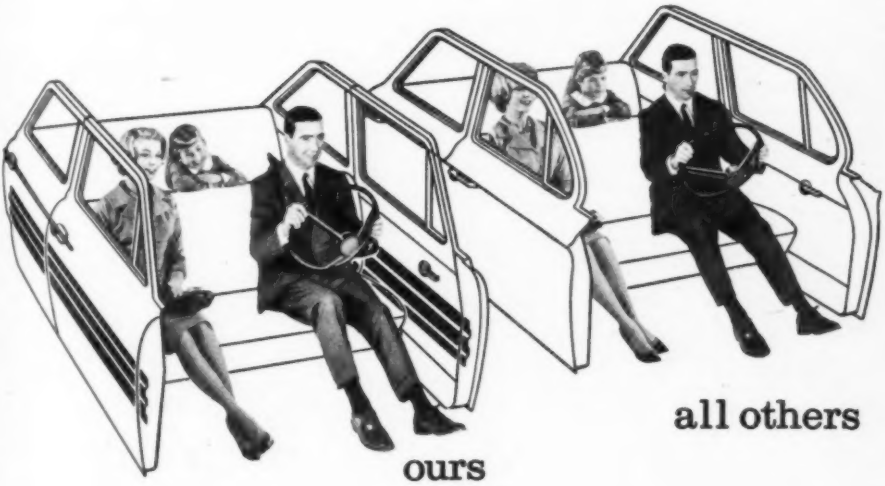
● *Did you happen to see Ed Murrow's show on CBS called The Great Holiday Massacre? It was about ten years of your writings condensed into an hour's show. I didn't see one original thought that you hadn't emphasized many years before. I certainly hope someone paid you for it.*

Jack Mather
Philadelphia, Pa.

It so happens I did see the show, Jack, and despite my boyish modesty, I'm forced to agree that every item Murrow emphasized had been written in these pages over a long period of years. What I *didn't* see in the show was what I didn't like, however. To me, the program lacked guts in not pounding home the fact that many of our cars are unsafe. One gentleman from Minnesota, though, did say that the cars were not all they should be, and for having this frame of mind I got the impression his introduction wasn't too enthusiastic. Much time was spent on the program in praise of seat belts, which was fine, but on several occasions it was admitted that the majority of fatalities result from doors popping open and people spewing out on the highway. There was no mention, that I recall.

[*Continued on page* 46]

Which doors are stronger?



Only in the 1961 Ford Family of Fine Cars are doors reinforced with steel beams

Ford Motor Company builds better bodies

• Doors in the Ford Family of Fine Cars are stronger. They are braced with steel ribs. This means they are more rigid and therefore close tighter and quieter. They are less subject to distortion, reducing the likelihood of developing squeaks and rattles.

• Also adding to the silence of the ride is extra sound insulation. In the Ford Family of Fine Cars there is up to 57% more area covered with sound absorption material.

• Millions of car frames are shaped like an "X." Weak in the middle, they lack the strength of strong side rails. Guardrail frames in our cars curve out. They are strong in the middle. This is true of Ford and Mercury. Guard rails also protect passengers in the unitized bodies of Falcon, Thunderbird, Comet and Lincoln Continental.

• Rubber body mounts are used to seal out road and engine noise. They prevent it from being transmitted into the car. The more rubber body mounts, the more effective the sound barrier. In the Ford Family of Fine Cars, with 50% more insulating body mounts, you get a remarkably quiet ride.

These are 4 of the many reasons we think you will find (upon comparing our cars with other cars) that Ford Motor Company builds better bodies.

Ford

American Road, Dearborn, Michigan

FORD · FALCON · THUNDERBIRD · COMET · MERCURY · LINCOLN CONTINENTAL

[Continued from page 44]

that the *manufacturers* are building the cars with the sleazy doors that pop open.

To me, the program pussy-footed around the issues without really tossing them on the table. If doors popping open are killing so many people (and I know this is true), why not put it right in the manufacturer's laps and *make* them build doors and locks that won't pop open? It can be done but it will cost more money—something a manufacturer doesn't like to hear. The whole show had a milquetoast approach. The subject matter was fine but somewhere, in my opinion, the guts ran out when it came down to the real issues. P.S.: I wasn't paid.

● *I saw the other day where a guy was voted "An Outstanding Driver" for something or other he had done. What, in your opinion, constitutes an outstanding driver?*

Clark R. Jeffries
Indianapolis, Ind.

One with five eyes.

● *Recently in Florida I tried to sell my four-year-old car which I bought in New York from a dealer who is no longer in business. It created quite a situation. I got a license in Florida, alright, but without a bill of sale (which had long before been mislaid) I couldn't get a clear title, allowing me to make the sale. By the time I dug into old cancelled checks and former records my customer had bought another machine. As this is being written, I have yet to receive a clear title but I'm working on it. Can't there be an easier way?*

Mrs. Arthur Florence
Ft. Lauderdale, Fla.

The title situation in some states is pretty close to assinine. I once sold a car in San Francisco that was registered in Connecticut. It took weeks to get all the necessary papers. A National Clearing House for titles would save the dealers and taxpayers a lot of trouble and make a lot more sense.

● *Why is a doctor's business called a "practice?"*

Louis Pellozza
Cincinnati, Ohio

If you'd had much to do with them, you would know the answer.

[Continued on page 48]

New from Wolverine!

WORLD'S LIGHTEST SERVICE SHOES

Most comfortable ever! Weigh a pound less than ordinary work shoes. Their exceptional lightness is so easy on the feet. Uppers are flexible elk-tanned leather . . . soles are springy, oil-resistant, neoprene cushion crepe, nearly three-quarters of an inch thick. Steel shanks, of course. And smart sports styling plus handsome Burgundy color add good looks to the comfort.

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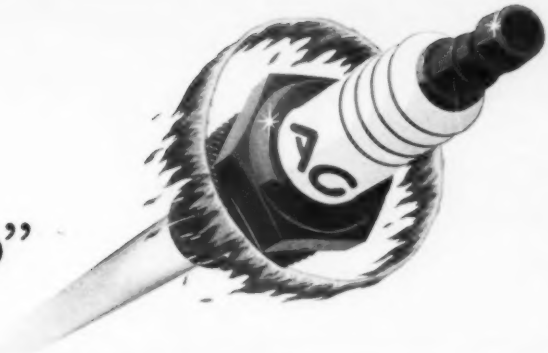
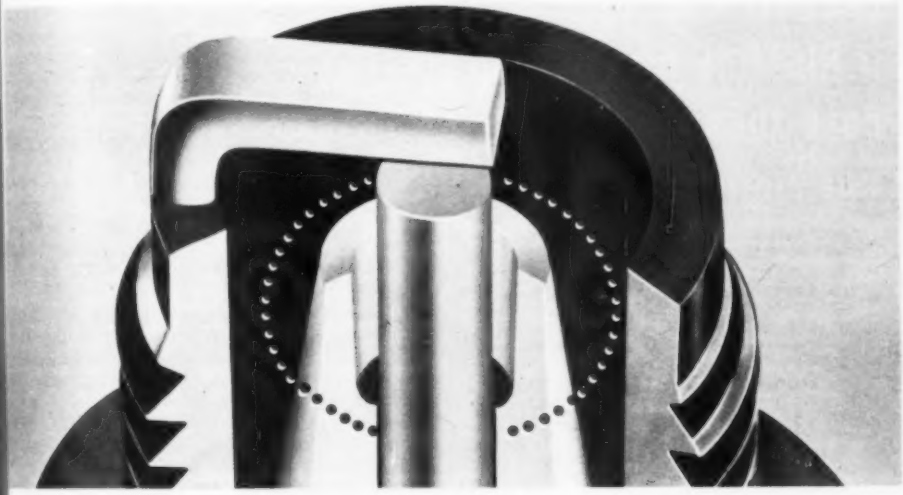
ROCKFORD, MICHIGAN

Service Oxfords · Work Shoes · Boots · Safety Shoes

exclusive AC "hot tip" insulator





provides self-cleaning action and sure-firing power at all speeds

AC Fire-Ring Spark Plugs offer extra miles of sure-firing power.

AC's Hot Tip insulator, uniquely designed and of near-diamond hardness, provides a thin, recessed tip that *heats faster* to burn away harmful deposits. This self-cleaning action means full-firing power at all speeds—for more miles. In addition, the Hot Tip insulator *cools faster*, to prevent pre-ignition.

Ask for AC Fire-Rings—with the exclusive Hot Tip—next time you make a spark plug change in your car or light truck.

AC SPARK PLUG THE ELECTRONICS DIVISION OF GENERAL MOTORS

AC Fire-Ring spark plugs

BUILT BEST FOR YOUR CAR, YOUR BOAT, YOUR LAWN MOWER —EVERY ENGINE YOU OWN THAT RUNS ON GASOLINE

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says

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Only $2.00. (Reg. $5.15 value) with purchase of one can of Rislone.
Four of America's favorite fishing lures: Silver Minnow, Shad Minnow, 2 "Barnstormer" spinner-fly combinations.

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I have purchased a can of Shaler Rislone. Enclosed is $2.00 check, money order or cash. (No C.O.D. or stamps) for the fishing lures.

Name (print) _____

Address _____

City and State _____

I certify the above customer has purchased one can of Rislone

Dealer's name _____

Dealer's address _____ M-4

Mail For McCahill

[*Continued from page 46*]

● *I have just purchased my fourth car on your recommendation. Thought I'd write and tell you how I first started taking your stuff seriously. About seven years ago when I was with an ad agency, your name came up as a possible endorser of a questionable automotive product we were promoting. I recall the account exec saying, "Not McCahill, he's too hard to handle. If he doesn't like it, he won't go along with it, regardless of what we pay him." I said nothing at the time but have been following your advice in MI ever since and buying my cars accordingly. I have yet to be disappointed. Keep up the good work.*

George Weeks
Baltimore, Md.

Thanks a lot, George. We do turn down products almost every week. If we didn't, the readers would have pushed me out of business long ago.

● *I've been told that bald-headed men make the best husbands. Is there any truth to this?*

Adele Fish
Brooklyn, N. Y.

Well, they *are* easier to find in the dark.

● *As far as I'm concerned, this country is going to hell in a handbasket! What burns me are such shoddy industrial practices as no longer dating flashlight batteries, building "sealed-in" units (meaning you can't repair your refrigerator or air conditioner), one-sided whitewall tires, idiot lights, 14-ounce "One Pound" tobacco cans and even short-ounce rations in hair tonics and mouthwashes. I think you once said the country is being run by thieves and I think you were right. Boilingly yours.*

Herb Marx
St. Louis, Mo.

Right, Herb, but you forgot to mention no trip meters on speedometers, no more tools with cars, or the fact that when generators, carburetors, fuel pumps and starting motors go bad today they are *replaced*, not repaired. You soon realize that the only interest the manufacturer of your choice has in you is in your dough, period. This is the era of incompetence, indifference, sleaziness and to hell-with-you at higher and higher prices.

● *As an ex-state trooper, I thought it might interest some of your readers to learn how we often caught drunken drivers. Of course there is the wild type of drunk who drives as fast as he can, weaving all over the road*

[*Continued on page 50*]

Pontiac's new Tempest coupe is here!

(Straight six-passenger model or custom bucket seat version)

Two sharp new coupes join the Tempest sedan and station wagon. Shorter roof lines. Longer rear decks. The custom coupe has a town car rear window, full carpeting, sports-type bucket seats. Both have independent suspension at all four wheels. Swing axles. Engine in front—transmission in rear. Big 15-inch wheels on a Wide-Track. You can cut a hairpin curve flat and steady. Call the shot on performance. A gas-saving, 4-cylinder, inclined engine with a horsepower range from 110 to 155. Drive the new Tempest coupe. It's priced with the compacts.

PONTIAC'S TEMPEST
PICKED BY MOTOR TREND MAGAZINE AS
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PONTIAC MOTOR DIVISION • GENERAL MOTORS CORPORATION

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hundreds of other uses.

*You name 'em!**

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FREE: *New 8-page*
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shows you how to save time, money and effort—with a Swingline Automatic Staple Gun. Send for yours today!

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Lafayette Radio, Dept. TF-1, P.O. Box 190, Jamaica 31, N.Y.

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Elmer's new Wood-Gluing Handbook tells you all about them, gives hints, tips, and tells what to use where. Send stamped, self-addressed envelope for FREE copy. Elmer, The Borden Company, Dept. MI-61, 350 Madison Ave., N.Y. 17, N.Y. (Available in Canada.)

Mail For McCahill

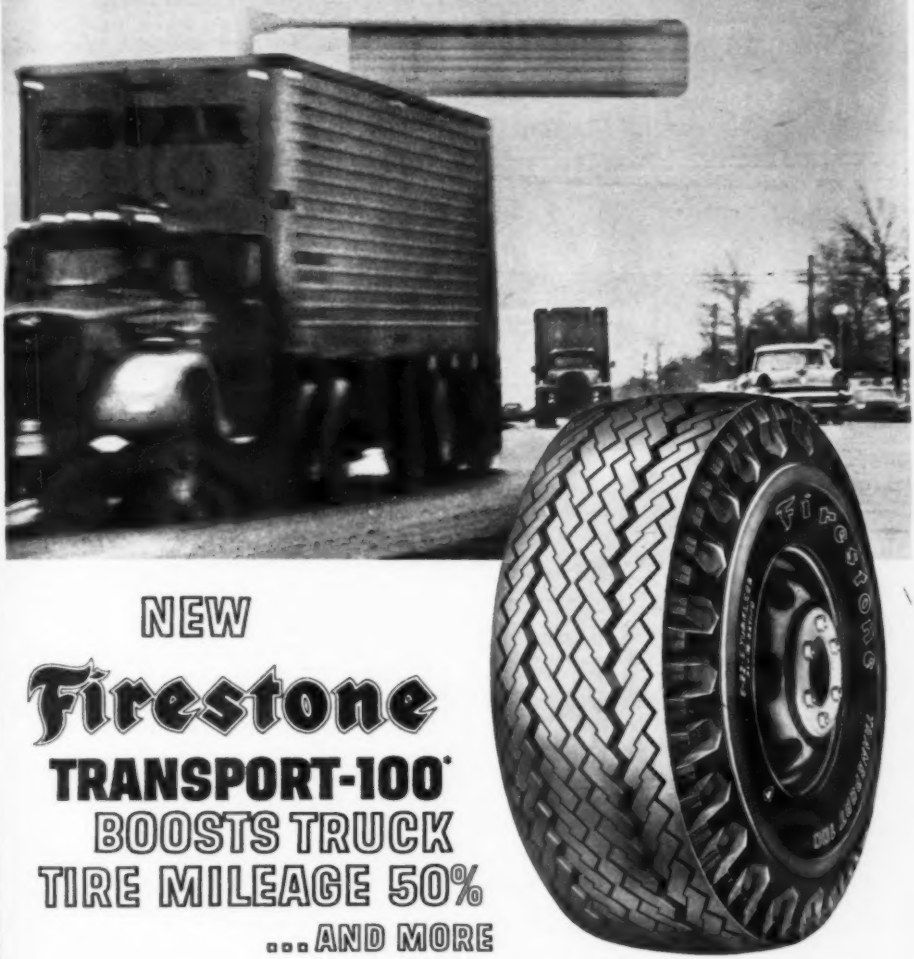
[*Continued from page* 48]

Anyone can spot him. This letter is about the "foxy drunk" (or so he thinks). The foxy drunk is just as easy to spot as the wild one, especially late at night. He does everything just a little too perfectly to be true. On an open highway or turnpike he drives nice and steady but about five to ten mph below the limit. In the suburbs, he spends too much time when he stops for a stop sign and there is no traffic around. He gives all the correct signals for turning, and when accelerating from a traffic light he does it ever-so-gently. In fact, this character does absolutely everything strictly according to the book—and that's how a good cop can tell, nine times out of ten, that the guy's drunk. We found out that late at night the normal driver, cold sober, will ride the speed limit right on the nose or just a hair over it. He will make kissing stops at stop

[*Continued on page* 52]

DON'T DO-ITS

Now . . . on your trucks . . . get an extra tire mile for every two you run!



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City ..... Zone ..... State .....

Mail For McCahill

[Continued from page 50]

signs and barrel away when the light turns green. The fine hair between this type of driving and reckless driving is so close the foxy drunk can't cope with it, so he underplays his actions too far.

H.B.
Summit, N. J.

I hope you were the kind of cop, H.B., who'd let a foxy drunk go with a warning or an escort home After all, he realizes his condition or he wouldn't be driving so carefully. Therefore, he deserves more consideration than the wild drunk killer. In places like Palm Beach and other noted resorts, if all the foxy drunks were run in, they'd have to have more rooms in the jails than they do in the hotels.

● *As far as I'm concerned, my wife is a RAT! I kinda love her but don't you think the following might be grounds for divorce? My place of business is about 20 miles from home and on the way there is a good five-mile stretch where I can really let the car out. Often, when I'm late for work, I'll push the car up close to 100 mph on this safe stretch. I made the mistake, however, of telling my wife about it. I'll give you one guess what she did; she told a cop we know and he bushwhacked me one morning and picked me up. My wife told me she did it for my own good. What do you think, Uncle Tom?*

Disgusted
Farmingdale, N. Y.

[Continued on page 54]

PLASTIC DINGHY

SPORTYAK dinghy of Marlex polyethylene made with hunters and fishermen in mind weighs 20 lbs., is 7½ feet long, takes 250 lbs. Marketed at $59.95 by Dayton Bait and Marine Products, 2701 Smith Dixie Drive, Dayton, Ohio.

Why try to get by with a "bargain" battery. Save time, money and trouble with a dependable Delco DC-12 Dry Charge! You can figure this one out fast. What does it cost you to be late for work? A couple of hours missed because of a bad battery adds up to inconvenience . . . and money. You'll avoid such trouble with a sure-starting Delco Dry Charge Battery.

ALL THE POWER YOU PAY FOR . . . DELCO!
A Delco DC-12 stays bone dry . . . can't lose any "zing" on the shelf! When you buy it, the dealer adds the fluid that activates it with 100% fresh starting power . . . plus the reserve power required for modern automotive electrical equipment.

YOUR BEST QUALITY BUY . . . DELCO DC-12!
Extra fluid capacity—Less refilling, less danger of damage from low fluid level. *Hard rubber case*—Stronger, also resists heat distortion. *Microporous rubber separators*—More current flows between plates, means peak power at all temperatures. Ask your dealer about these and many other Delco quality features.

A DEALER NEAR YOU . . . DELCO!
He's a *local* businessman who appreciates your service business, wants to keep it. Automotive service is not just a sideline with him . . . it's his *specialty!* He knows your driving needs, can recommend the right Delco Battery for your car.

BE SURE . . . REPLACE WITH DELCO!
For dependable starting in any weather, replace with 100% fresh Delco. It's "Designers' Choice" for new GM cars, survey-proved as "Drivers' Choice" for replacement, too. When it's time to replace your old battery, make sure you get a Delco DC-12!

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W. E. DUNN MFG. CO.
523 W. 24th St., Holland, Mich.

Mail For McCahill

[Continued from page 52]

It may come as quite a surprise to you, Disgusted old boy, but your wife isn't alone. I have some friends in various police organizations in Florida where I live and they tell me that on several occasions wives have called up and tipped off the cops that their husbands were looping it up regularly on the way to work and to please pick them up—which the cops gladly did. I doubt if there are any grounds here for divorce—but it doesn't seem very sporty of them.

● *I am thinking of restoring a 1928 Minerva that belonged to a late friend of my father's. How much of a job do you think this could amount to?*

Bruce R. MacNamara
Los Angeles, Calif.

The Minerva was powered by a sleeve-valve engine. It was a wonderful car at the time but if not in top shape now, it would be slightly harder to restore than your father's late friend.

● *I'm an ardent fan of yours and MI's. If you ever start a cult, I'll be the first to join.*

Julius C. Hatchett
Marion, Ill.

We are thinking of organizing a cult whose purpose will be "Help Stamp Out Hair."

● *I have a 1950 Chevy and I want to put large tires on the old crate; about 18"-20" ones if possible. Is there a wheel that will fit without any alterations? I want traction and height for the places I hunt. Please, old pal, if you answer me, don't give me one of those three-word answers of yours like "Get a Jeep."*

Bill Theis
Williamsport, Pa.

How about a four-word answer then—like "Get a Land Rover?"

—Tom McCahill

Ball Simulates Satellite Tumbling

A fiber glass ball ten feet in diameter will be installed at Brooks Air Force Base in San Antonio, Texas, for studies of satellite tumbling and spinning. A man can ride inside the ball which itself rides on a circular stream of air. From the system scientists hope to learn more about man's ability to perceive complex rotation and to tolerate the physical and mental stresses of rotation.

The
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is the
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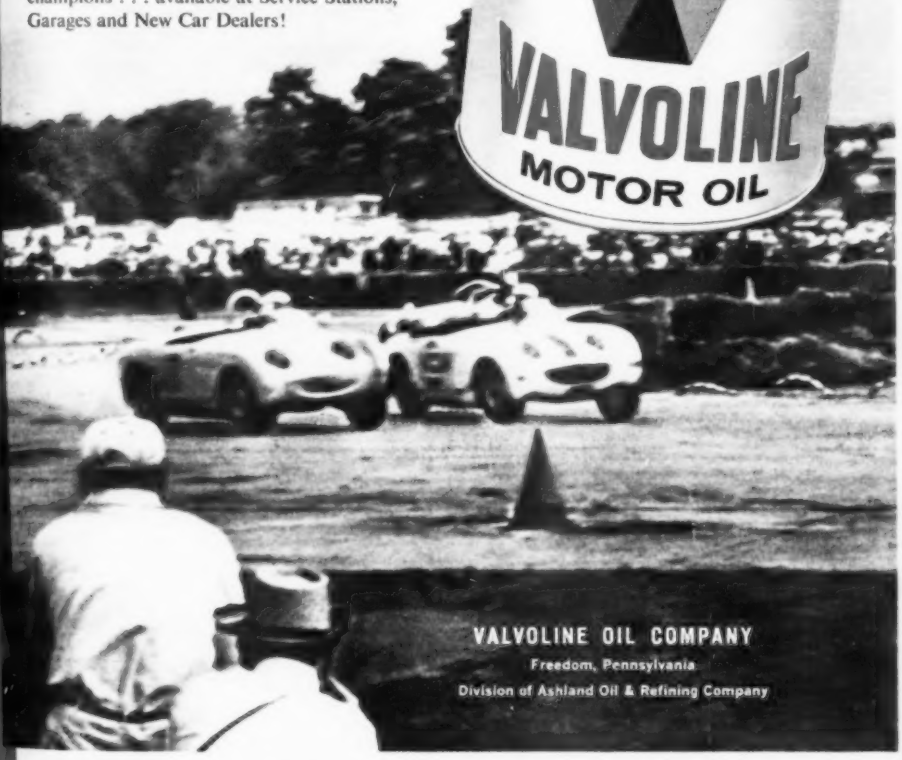
The final authority for the kind of motor oil that's right for your sports car engine—is the engine itself! That's why Valvoline—with Miracle Chemaloy—is the result of thousands-upon-thousands of tests in engines operating under all conditions of speed, traffic, terrain and temperature. Valvoline is the motor oil your engine would choose for itself! The motor oil that not only gives you the *ultimate* in lubrication protection, but also *cleans your engine as you drive!* Result . . . *more* engine power. *Less* engine wear. Savings on gas and repairs! No wonder sports car owners in 54 countries drive with Valvoline, the motor oil of the champions . . . available at Service Stations, Garages and New Car Dealers!



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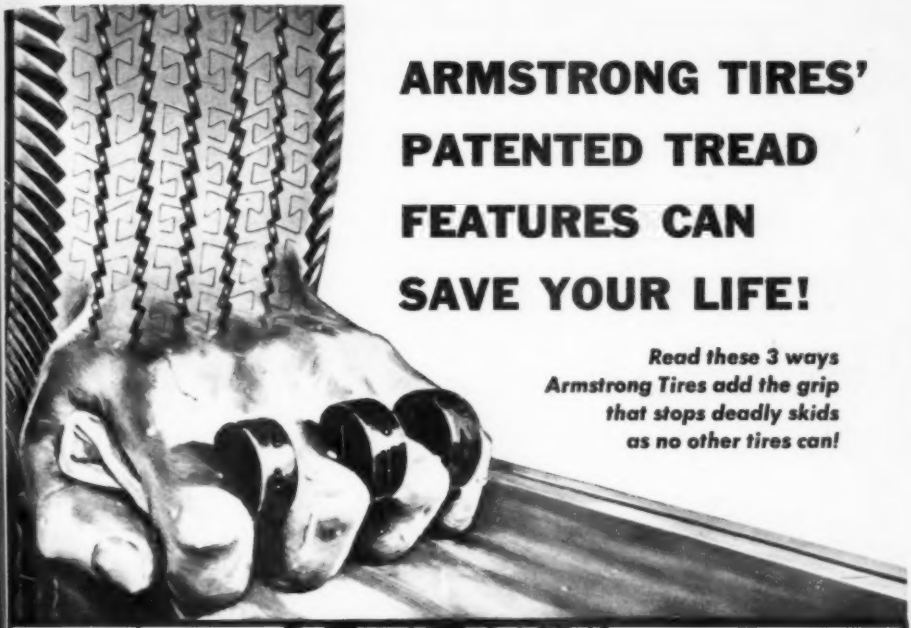
NOW SEE THIS!

OUTBOARD-INBOARD can mean many things but here it means a 40-foot cabin cruiser converted to outboard power to save the cost of installing a new inboard. Owner Henry Verrier of Coventry, R.I., put well in transom, devised special controls for the twin Johnson V-75s. Now he saves on fuel and gets 20 mph top speed with the old inboard was 18 mph.

RAIL FLAW DETECTOR developed by Bramson Ultrasonic, Stamford, Conn., is shown being put through preliminary field evaluation by Bramson employee. The device not only detects flaws in the rails but indicates flaw by audible tone in earphones. Five-pound unit operates at 3.5 megacycles. Batteries and circuitry of the transistorized device are mounted conveniently in handle—no clumsy knapsack.



ARMSTRONG TIRES' PATENTED TREAD FEATURES CAN SAVE YOUR LIFE!

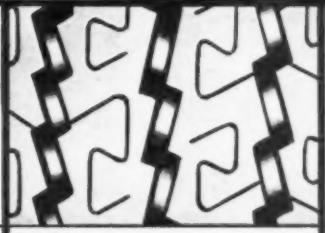
Read these 3 ways Armstrong Tires add the grip that stops deadly skids as no other tires can!

Famous "Ounce of Prevention"

PATENTED SAFETY DISCS KEEP TIRE'S GRIPPING EDGES OPEN

Just as Safety Discs in fist (above left) keep fingers apart, so over 1000 Safety Discs in each Armstrong Tire keep tread's gripping edges apart, always ready to grip – no matter how hard you brake!

But fingers of fist *without* discs (above right) *can* squeeze shut. That's why ordinary tires, lacking Safety Discs, can squeeze smooth and slippery under braking pressure – *and you skid.*

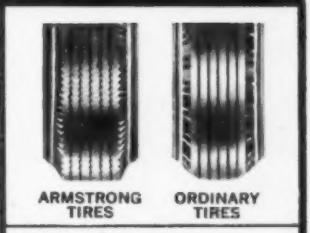


Grip in all directions!

PATENTED INTERLOCKING SIPES ADD OVER 2600 GRIPPING EDGES!

Sipes are slots put in tires to add gripping edges. Only Armstrong tires have S-shaped, *interlocking* sipes. They add over 2600 gripping edges, provide "bite" in ALL directions, sharply improve protection against forward *and* side skids.

In winter, interlocking sipes' "wiper" action keeps you safer on wet roads, gives you snow tire "go" on packed ice and snow.



Grip where it counts!

UNI-CUSHION CONTOUR LAYS MORE LIVE RUBBER ON ROAD

Armstrong Tires, when inflated and rolling, put more tread – more gripping edges – on pavement. Greater stability at high speeds! Faster, surer stops when you brake!

Another extra: Armstrong's anti-vibration tread literally cancels noise! No hum, no whine, no drone: you ride on a whisper. Talk to your local Armstrong dealer – he's listed in the Yellow Pages.

GET EXTRA SAFETY AT NO EXTRA COST WITH

ARMSTRONG TIRES!

ARMSTRONG RUBBER COMPANY, Home Office, West Haven, Conn.

AS LOW AS **$10.95** (6.70 x15)

plus tax and your recappable tire

Here is exciting news about some of the miracles of science that soon will become realitie

SPACESHIPS may use the exhaust gases fired by their rockets as antennae. Ionized gases are good electrical conductors and could be used for this purpose, according to researchers of the International Telephone and Telegraph Corporation Federal Laboratories, Nutley, N.J. Using the long exhaust trails as antennae would open up a whole new frequency range for interspace communications without increasing the weight of space vehicles. These lower frequency bands have not been used in the past because they require huge antennae.

Cancer research has narrowed the field of possible drug cures to 160 drugs which are tested for their effectiveness on disseminated cancer—cancer spread through the system. This type is impossible to treat by surgery or radiation. Treatment by drugs that can reach and destroy malignant cells wherever they may be has been at least temporarily effective in some 30 types of cancer. All the drugs being tested are lethal poisons and must be administered with great care. Methotrexate, a promising anti-leukemia drug, is administered with an antidote, leucoverin, to prevent damage to bone marrow.

Radio pills are small battery-operated objects that travel through the alimentary tract, transmitting radio signals to an FM receiver outside the body. The signals tell the medics useful things about pressure changes in the stomach and intestines. Trouble with them in the past has been that the batteries used have worn out quickly and the signals died; now there's an RCA-designed pill with a battery that can be pepped up by an outside energy source so that the traveling transmitter can complete the course. Research is underway to make the pill capable of measuring temperature and acidity as well as pressure.

Cotton fabrics that are not only wrinkle-resistant but that resist the tendency to yellow during laundering may come of a new process developed by Cone Mills Corp., Greensboro, N.C. Most commercial finishing processes u nitrogen compounds. These tend to ret chlorine which yellows and weakens the fab in the presence of heat. The Cone proce used a new compound, diglycidal ether, whi contains no chlorine-retaining compoun

Painting submarine interiors has been problem in the past: the harmful fumes slow-drying paints could restrict a sub's di ing time seriously. Now the Navy has a pa that will serve as either a bulkhead or de paint, loses 95 per cent of its fumes within hours of application and releases the rest harmless amounts. With the new paint a s crew can redecorate at sea without creati a health hazard.

Motor oils that give 50 per cent lon service than present commercial oils h been produced thermal diffusion a new heat proce that concentrat the highgrade l bricating molecu of the oil. The ne oils show litt change in their fl properties at e treme highs or lo of motor operati temperatures. T men working them at Standa Oil labs in Clev land, Ohio, hint year-round oils th will not react to e tremes of weath conditions.

De-salting s water may become feasible through the u of a new system that is a product of the Ge eral Electric labs at Schenectady, N.Y. T system uses an assembly of revolving blad that work much like windshield wipers. V porization of the water is accomplished wi out boiling or bubbling. Water produced b the system is salt-free to within one part salt to 1,000,000 parts of water.

Along with new types of gas masks agai chemical and germ warfare, the Army Che ical Corps is testing special protective shelt for children up to the age of four. The p tent-like devices have aluminum frames wi a vinyl covering. Large filter pads will k out harmful substances in the air. The shelt have clear plastic windows and large flaps putting toys, etc., inside.—*Harvey Gard*

Enjoy outdoor living at its best—

BUILD A PATIO WITH TRANSLUCENT ALSYNITE

This wonderful outdoor living room is built of Alsynite – the versatile translucent building panel you can use in so many ways. You'll find it's surprisingly easy to handle, for it combines light weight with unusual strength. Reinforced with millions of glass fibers, Alsynite is shatterproof, requires a minimum of structural supports. Alsynite transmits only soft diffused light – eliminates glare. And since it requires no special handling or tools, it lends itself to a range of projects – fencing, patio and carport covers, interior dividers. A variety of colors, sizes and textures in corrugations or flat panels – backed by Alsynite's 10-year guarantee and the resources of RCI, a great name in chemicals. Look for it at your dealer's, listed in the Yellow Pages under plastic products – and for your free folder, write Alsynite, San Diego 9, California, Dept. MI-661.

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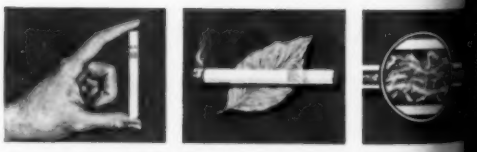
Outstanding...and they are Mild!



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MECHANIX
ILLUSTRATED
June 1961

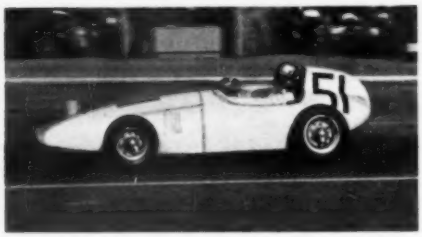
MAKE WAY FOR JUNIOR!

Small but fast, Formula Junior racing cars are the latest sensation of American tracks!

By Harvey Janes

A NEW craze is sweeping the auto racing scene. It's called Formula Junior racing—racing delightful little single-seat cars that are such fun to drive that they represent a serious challenge to sports car road racing. The story began a couple of years

RETTY GIRL—pretty car. It's r own MIMI about to drive an VA, also shown on our cover.



TARASCHI

DAGRADA

ago in Italy when Count Giovanni Lurani, a former race driver who has in recent years been extremely active and influential in the F.I.A. (Federation Internationale de l'Automobile) conceived the idea of a new racing class that would provide the same general driving characteristics of the full-scale Formula I cars as to handling, braking, etc. They would have to be "slow" enough so that relative novices would be able to handle them without excessive danger, yet powerful enough to provide genuine Grand Prix thrills. After some deliberation, the following basic rules were laid down:

1. Only production touring-car engines could be employed, with push-rod valve actuation. No single or double overhead camshafts were to be allowed.

2. Maximum engine displacement was set at 1100 cc. Engines could be bored out (not in excess of 1100 cc., of course) or "sleeved" down to the displacement limit but the stroke was not to be altered.

3. Supercharging was not allowed but almost any other hop-up technique was permitted.

4. The gearbox had to be from an F.I.A.-approved touring car, although any gearbox could be mated to any engine and the number and staging of gear ratios was optional.

5. The braking system had to be essentially the same as on the car from which the engine was taken, though special lining materials, etc. could be used.

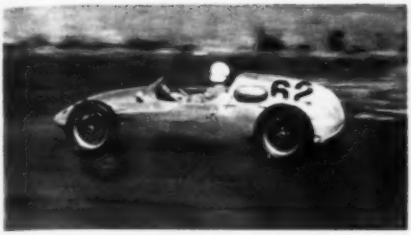
6. The body had to be an open single-seater, without fenders, incorporating a roll bar for the driver's protection. Certain minimum dimensions for the body were established as well.

Other regulations called for the use of an automatic starter, stated that all cars would run on normal commercial fuel and prohibited the use of self-locking differentials and other specialized equipment.

Since its conception, with a few ups and downs getting started, the Formula Junior has caught on amazingly and a number of makers are turning them out. There are roughly two dozen individual makes on the market (though some are not sold directly in the U. S.) and with the various combinations of engine and gearbox that can be selected it shouldn't be too difficult to find a car to suit any competitive driver's personal taste.

At this writing, Juniors are being manufactured in Italy, England, West Germany, Switzerland, Canada and the United States. Others are sure to follow now that the Formula has become so popular.

The Formula Junior car is all business. Inside the cockpit there is room for only one man—the driver. At that, there is barely enough room for him; he is held firmly in position behind the controls by a real bucket seat that grabs him by the hips and keeps him from sliding during hard cornering. The controls and instruments themselves are kept to a minimum to avoid confusion and to cut weight. There is no speedometer because speed in miles per hour is of no interest to a racing driver. What he



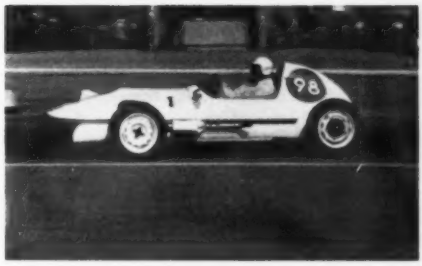
COOPER

STANGUELLINI

does need to know is engine speed, so he is provided with a huge tachometer that sits in the center of the tiny dash. Usually a water temperature gauge and an oil pressure gauge are grouped around the tach. There is no heater, no radio, no cigarette lighter, no lights—no nothing except what is needed to make the car *go*.

Seated in this stark but beautifully efficient office, the driver has unlimited headroom and an unmatched view not only of the road in front of and behind him but of all four wheels. If the car is front-engined, the long hood will slope down dramatically in front of him to a neat little snout designed to cut as small a hole as possible through the atmosphere. A rear-engined car will present even less up-front opposition to the wind. Wherever the engine is located, the Formula Junior car is perfectly balanced and you know it even before you drive it. You can sense the balance and the feel from the moment you slide behind the controls.

But it isn't until you have started the engine, and heard that earsplitting symphony of unmuffled and unadulterated joy, that you really begin to appreciate the wonders of a pure-bred racing car. When you consider that the typical Formula Junior engine is derived from an economy sedan or small roadster capable of speeds somewhere between 70 and 85 mph, the sounds produced by the exhaust of a Junior are all the more incredible. I can almost guarantee that if you allow yourself to go even this far—to sit in the cockpit of a Junior and fire



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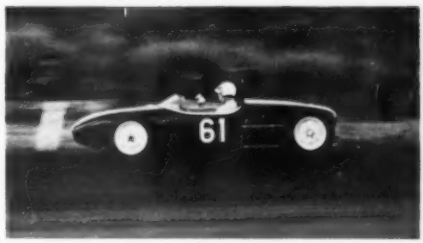
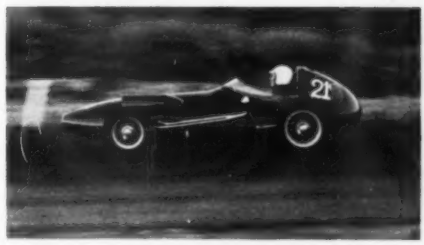
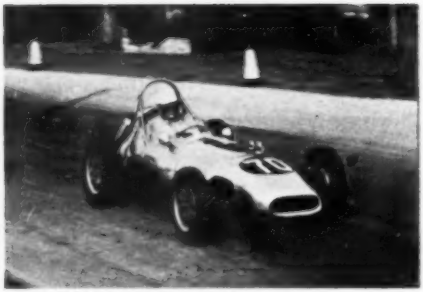


LOTUS

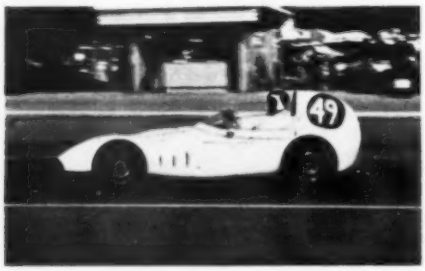


SADLER

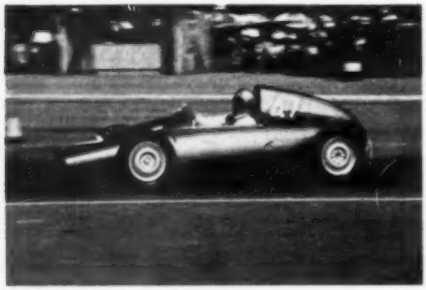
BMC



GEMINI



VOLPINI



WAINER

up the engine—you will be hooked for life, if not as a driver, at least as a devoted fan.

But the ultimate thrill does not come, of course, until you do drive the car. Here again, considering the heritage of the Formula Junior racing car, its performance and roadholding are almost beyond belief. This is not to say that Fiat 1100s and Sprites and Ford Anglias and the like are not peppy, good-handling cars. Indeed, they are far superior to any normal passenger vehicle and provide a great deal of enjoyment for many thousands of previously-frustrated drivers. But even a top sports car doesn't really handle when compared to the average Junior. From the moment you put the car in motion you have a whole new concept of what the steering wheel and brake and gas pedals are for. They do not enable you to control the car; they make you an integral part of the car itself. When approaching a corner, you look down and note that the front wheels are shifting their direction (remember, you can see all four wheels). You will not recall having turned the steering wheel with your hands. It will be almost as if the wheels are an extension of your own body. You will feel them gripping the road surface and balancing the surging power from the driving wheels.

Take the car out for a few practice laps. You will learn, as you accelerate up through the gears at a breathtaking pace, that the power does not really come in until the engine is turning at least 4000 rpm. At that point all hell breaks loose and it will require all of your concentration and willpower to keep the tach needle from flashing past 8000. Relative to weight there is so much power available that you will have to be careful to avoid wheelspin in the lower gears, especially while shifting up under part

or full throttle. In top gear, if the straight is long enough, your tachometer will indicate 7500 or more, which will be equivalent to 120 mph or better.

Approaching corners you will find that a hard application of the brakes from such speed does not make the car feel as though it wanted to go off in all directions. Instead, the deceleration will be powerful and yet smooth and even, and you will have no difficulty placing the car for the corner—once you have learned the correct line, that is. At that moment you will really appreciate being able to see the front wheels. Naturally the line through any given corner will not be the same for all Juniors. There are noticeable differences in handling characteristics between front and rear-engined cars, between front and rear-wheel drive, with solid or independent rear axle set-ups, or even between two almost-identical cars. But whichever Junior you try, you will find its handling to be in a completely different league from anything [*Continued on page* 156]

Name	Country of origin	Wheelbase in inches	Approximate price	For further information, write to:
APACHE	U.S.	83.0	$3,600	Apache Racing Cars, 1414 Main St., Walnut Creek, Calif.
DKW	U.S.	83.0	$2,800	DKW Enterprises, P.O. Box 7022, Spokane 11, Wash.
BMC	U.S.	78.0	$4,000	British Motor Cars, 1800 Van Ness, San Francisco, Calif.
CIVET	U.S.	82.0	$3,600	Performance Eng. Co., 6061 Manistique, Detroit 24, Mich.
COOPER	Gr. Britain	88.0	$4,000	Cooper Car Co., 243 Ewell Rd., Surbiton, Surrey, England
DAGRADA	Italy	79.0	$4,000	Biener Imported Cars, 250 Northern Blvd., Great Neck, L.I., N.Y.
DANE	U.S.	90.0	$3,400	Dane Racing Cars, 12900½ Washington Blvd., Los Angeles 66, Calif.
ELVA	Gr. Britain	89.0	$3,000	Charles Kreisler, Inc., 241 Park Ave., New York, N. Y.
GEMINI	Gr. Britain	82.0	$4,300	Automotive Research, 5201 W. County Line Rd., Milwaukee 3, Wis.
ISIS	Italy	86.5	$4,300	European Cars, Inc., 1201 W. Liberty Ave., Pittsburgh 26, Pa.
LOLA	Gr. Britain	82.0	$5,300	Allan Ross, 727 Cummings Ave., Kenilworth, Ill.
LOTUS	Gr. Britain	90.0	$4,500	Jay Chamberlain, 4110 Lankershim Blvd., North Hollywood, Calif.
MACHAN	Switzerland	80.9	$4,000	Thompson Bros., Inc., 2820 Gilbert, Cincinnati 6, Ohio
MITTER	W. Germany	82.6	$4,900	Vogue Motor Imports, 1322 So. Wabash, Chicago 5, Ill.
SADLER	Canada	80.0	$3,500	Sadler Car Co., St. Catherines, Ontario, Canada
STANGUELLINI	Italy	79.0	$4,500	Momo Corp., 33-49 55th St., Woodside, N.Y.
TARASCHI	Italy	79.5	$4,000	Biener Imported Cars, 250 Northern Blvd., Great Neck, L.I., N.Y.
VOLPINI	Italy	82.5	$4,400	Biener Imported Cars, 250 Northern Blvd., Great Neck, L.I., N.Y.
WAINER	Italy	78.5	$4,500	Biener Imported Cars, 250 Northern Blvd., Great Neck, L.I., N.Y.
Note: Almost all these cars are available with a variety of engines, including DKW, BMC, Ford and Fiat.				

OUTDOORS
with
W. Scott Duncan

TEACHING YOUR SON TO FISH

WHAT is the best way to teach a young and eager boy how to fish? There are ten easy steps that will almost always insure success.

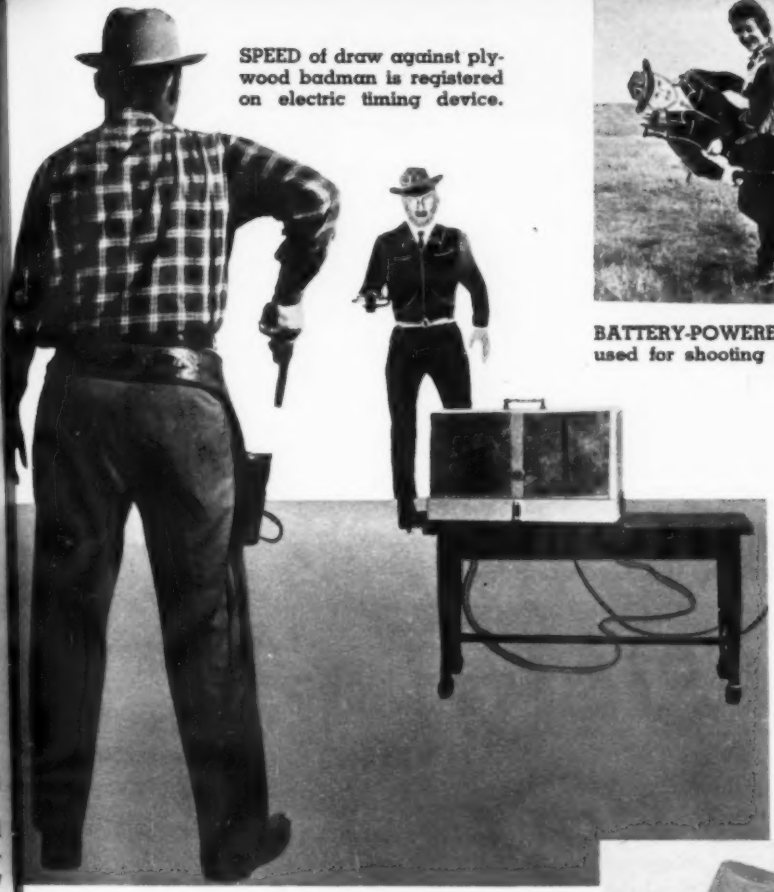
Step one is to start him off with the right fish. Small fry want to catch fish. If bites don't come fast and frequently youngsters are likely to lose interest. Best fish to start him on is any of the sunfishes. Most popular sunfish is the bluegill, found all over the U.S. in streams, rivers and lakes. Bluegills are dandy fighters but little skill is needed to land a mess of them.

Step two is to equip your young angler with the right tackle. Not old stuff you are ready to throw out nor a toy outfit from a drug store. Take him to a good tackle store and buy him a 7½-foot, tubular glass fly rod with medium action, a single action fly reel, a three-dimension floating fly line with a *long trout taper*. A short bass bug taper will not handle the very light bluegill bugs he'll be using after he has learned to catch fish with bait. Cut off several feet of the long taper and you'll have just the right taper for bluegill bugs and flies when the time comes for your boy to use these lures. Next, stock up with half a dozen knotless Stren leaders tapered to 2x and a dozen Model Perfect trout hooks, size #10. You might also get him several small floats and a box of split shot. This is bluegill tackle anywhere in the country and should cost you no more than $35 or $40. When boys take part in the selection of their tackle and are told just why each item is selected, they usually treasure it.

Step three is to start him fishing with the best bait; those little pink garden worms about one and one-half inches long. You find them around barns, along creeks and lake shores in damp soil. Take your boy and let him catch the worms as you turn the soil up with a spade. Get 30 or 40 worms, put them into a clean can filled with damp earth and leaves and moss. Keep them cool and out of the sun.

Bluegills bite all year, even in northern states. Any month is a good time to start your young angler fishing for them. But the best time is from mid-May till mid-June north of parallel 40, and earlier in the south. At this season, bluegills spawn. They make beds in sand or gravel close to shore or anywhere in shallow water. You can spot these beds by going along slowly in a boat and looking for bushel basket-sized, bowl-shaped places cleared out in the weeds and grass with the bottom showing. Often hundreds of these fish congregate to bed in a small area.

Step four then is to scout around and find a concentration of bluegills before you start fish- [*Continued on page 160*]



SPEED of draw against plywood badman is registered on electric timing device.

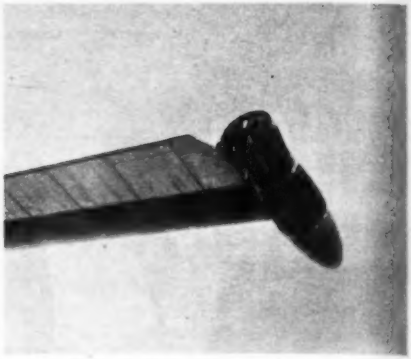
BATTERY-POWERED dummy is used for shooting out of doors.

THIS TARGET SHOOTS BACK

PLYWOOD badman gives fast-draw artists something to aim at . . . like turning him off under 6/10ths of a second—the time the live gunman is allowed before dummy starts blasting . . . electrically operated ruffian has lightbulb eyes that flash on shortly after timing device is tripped . . . that means, "Draw, Pardner" . . . if challenger's wax bullet hits robot's body (in allotted time) above his hinged waist, timer disconnects . . . otherwise—*Bang!* . . . desperado's blank-loaded sixshooter explodes . . . sharp-shot lawmen practice on these dingos . . . fast-draw buffs are buying 'em too . . . made by Continental L&P Products Co., Dallas, they sell for $200. •

ROBOT'S sixshooter fires when wire fastened to the trigger is pulled taut by timer. Batteries or 110V current operate targets.

ROTODYNE on ground. Prototype has carried cargo, stretcher cases, bridge sections.



ROTOR JETS are mounted at tips of rotors through which air and fuel are fed to them.

AIRLINER TAKES OFF STRAIGHT UP!

By Myron Gubitz

THE trouble with flying, especially with intercity flying like New York-Washington, L.A.-San Francisco and similar short hops, is the time it takes from downtown to the airport. Add city-airport time, flight time and airport-city time and you often have time enough to go by train or bus which leave and arrive downtown. The latest attempt to find an aircraft that will take you from one central location to another, without the boondocks interludes, is the British Fairey Rotodyne, a development of the Fairey Aviation Co., Ltd.

The prototype model of the Rotodyne has been flying three years while undergoing tests, changes and redesign. It's a big aircraft that can carry 70 people at 220 mph for distances up to 600 miles. It is powered by two 2,800-hp Napier Eland turbo-prop engines. The production model will replace these with 5,250-hp Rolls-Royce Tyne engines. These engines are used for forward flight and to run the air compressors needed for vertical flight.

The engines are mounted on stubby wings set high in the box-like fuselage. Atop the fuselage is a large pylon that supports a four-blade rotor.

There are a number of remarkable features about the Rotodyne. Probably most important of these is the rotor-drive.

Most helicopters are powered by one or two conventional engines—either piston or turbine—which drive the rotor by

means of a complicated transmission system. This has two great disadvantages. First, the transmission is heavy, expensive to build and maintain and subject to all sorts of mechanical difficulties. Second, the rotation of the shaft-driven rotor creates torque—a tendency to twist the aircraft around to the side. This torque must be offset either by a small, vertically-mounted rotor in the rear of the ship, or by a second large rotor which rotates in the opposite direction to the first.

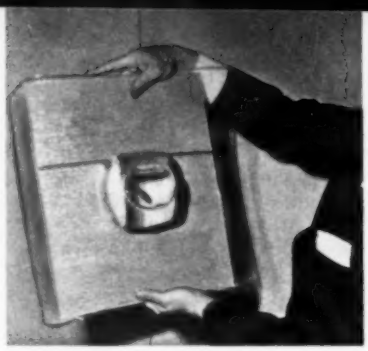
The Rotodyne has no rotor transmission system to worry about and no torque problem. Its rotor is driven by four small jet engines mounted on the tips of the rotor blades. Air compressors, which operate off the two engines, feed compressed air through ducts up to the tip-jets. There the air is mixed with kerosene and ignited.

The Rotodyne's landing gear is a tricycle gear, fully retractable, much like those in use on conventional airliners. Most other helicopters have non-retractable gear. The plane's landing gear has been specially equipped with "dampers"—a type of shock absorber—to withstand the vibration strains put on it during takeoffs and landings.

Flying a craft like this one involves new procedures. Here's how it works:

Before starting the twin turbine engines, the pilot adjusts the pitch of the conventional [*Continued on page* 158]

UPSTAIRS, propellers take over, jets die down, rotors whirl around without power.



GOLDFISH bowl (with fish) is sealed to cardboard base with plastic film.

HOW TO WRAP A GOLDFISH

A NEW method of plastic vacuum packaging household items—yes, even live goldfish—promises to revolutionize the moving industry. The process, known as Poly-Tite, uses a lightweight sealing machine developed by Avery Industries of San Francisco to draw a thin plastic film over items placed on a special cardboard base. Heat and vacuum are then applied to seal heremetically the objects covered. Goldfish in a bowl will live three days in such a package. •

ONE MAN operates Poly-Tite machine as another arranges items on panels.

WHIRLWIND CAR CLEANER

"WINDJAMMER" car cleaner fits in entrance of car and sucks out refuse.

THE latest thing in car-cleaning machines is in use by the Santa Fe Railway. The unit attaches to one end of an opened car, then its two 24-inch exhaust fans are turned on and in a matter of minutes all dirt and other refuse is sucked into a supporting wire-mesh cage behind the fans. •

WORKER dumps ash trays, dislodges trash which machine then draws out.

GERMANY MARCHES AGAIN

CONTINUED . . .

GERMANY MARCHES AGAIN

AMERICAN veterans of World Wars I and II may be excused a slight uneasiness at looking at these photos of Germany's new army—well-trained, well-armed, with the confidence of professional soldiers.

Scarcely 15 years ago Germany was beaten to its knees, the arrogant legions of the Third Reich destroyed, the cities in rubble. Today, Germany marches again—mostly with funds and arms supplied by its conquerors.

The armed forces of the German Federal Republic consist of about 200,000 men divided into 12 divisions. German military experts believe the concept of a mass army based on general conscription is outmoded. Instead, the Bundeswehr is an army of specialists, volunteers of long service armed with the most modern weapons available. Defense Minister Franz-Joseph Strauss feels the German army should be long on fire-power with a minimum of supply forces—"sharp teeth and a short tail."

Each of the 12 German divisions has three brigades—each trained to operate

NEW MODEL of German-made bazooka is a lightweight weapon with a shoulder stock.

U.S.-MADE 105mm howitzer is fired by a unit attached to German infantry brigade.

BIG BAZOOKA, American-made, is standard equipment. Man at right has phone helmet.

HONEST JOHN 762mm rocket gets last minute check-out before a launching while on maneuvers.

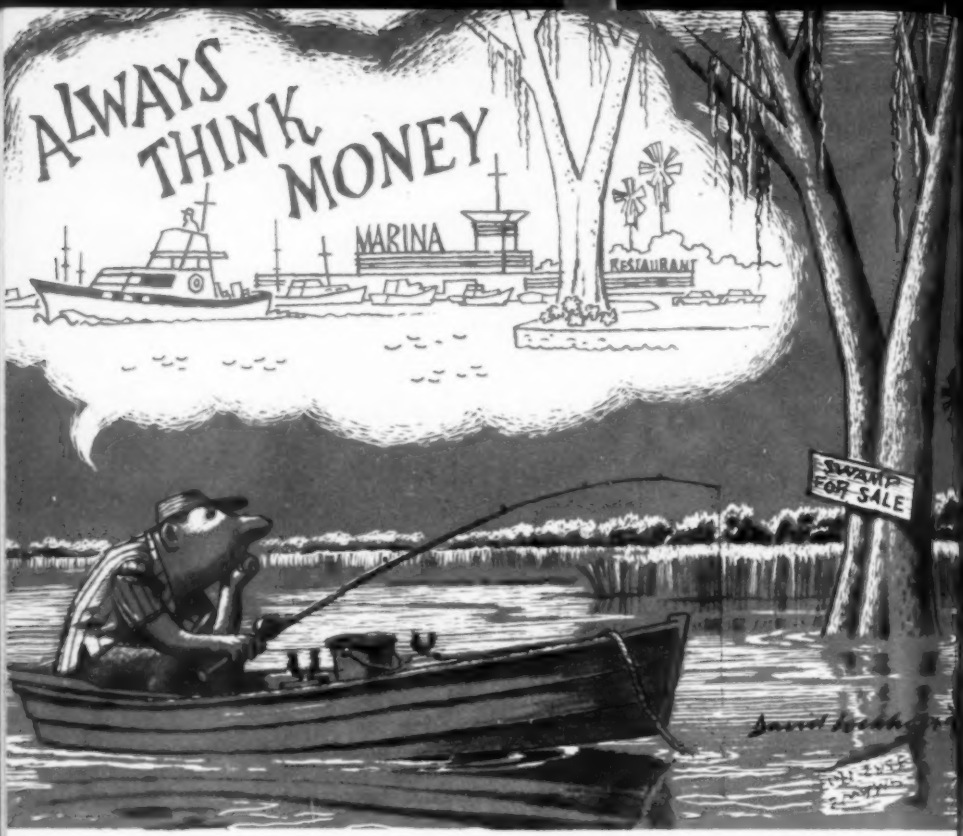
BELGIAN-MADE automatic rifle is basic infantry weapon. Note the GI-style helmet.

as an independent unit. In addition to the infantry, there are special divisions of paratroopers and mountain warfare specialists. There are also artillery, rocket and signal corps units.

All German troops are equipped with the most modern weapons. Much of the equipment is supplied by the U.S., but in several cases our weapons have been tested and [*Continued on page* 170]

PREFERRED over U.S. machineguns is this German-made weapon, firing from a bipod.

AMERICAN tanks including the M47 (shown here) and M48 are in use by German forces.



6 SECRETS OF MAKING MONEY

By Lester David

"SUPPOSE all the people in the world were ordered to throw every cent they own into one enormous pile. And suppose the cash was then divided equally among all the people in the world. Do you know what would happen?

"In ten years, the same people who have the large fortunes now would have them back again!"

So said a famous business sage. Is it true? Are there really people who turn everything they touch into gold? Can this unique gift be acquired by others?

According to Dr. Richard H. Hoffmann, a nationally prominent psychiatrist, "Some people possess a talent for music or painting, others have mechanical aptitude, a so-called head for figures or green thumbs for growing things.

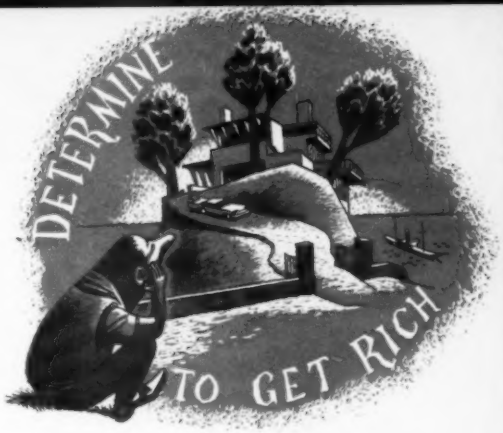
Similarly, a number appear to have a special ability for accumulating large sums of money.

"Most normal people can learn to play a musical instrument, grow plants or even paint passably well. It follows that an individual can certainly learn and apply the qualities of mind and character that the money-makers possess."

Well, what are we waiting for? What makes the moneymen tick?

Here are the characteristics they possess, as reported by experts in human behavior and researchers who have put America's successful men under their investigative microscopes:

● *They have cash-register brains.* They are keenly money-minded—they see everything in terms of potential profit and loss. Suppose a new shopping center is announced in a suburban community. A housewife hearing the news will think in terms of shopping and convenience. Some men will at once think of increased traffic congestion. The money-minded man, however, says to himself: "Is it a good location? What about the competition? What kinds of shops are needed most?"



Here are some examples of money-mindedness in action: A while back, a State agency in New York announced that a new road would be built through vacation territory. To most people it meant quicker access to fishing and fun spots. But one man thought money. He investigated, bought up some land in the area and in a short while sold out to motel interests at a $25,000 profit.

Recently this reporter interviewed the head of a large drug firm that was about to market a revolutionary treatment for circulatory disease. When I explained the discovery to friends, they were impressed by its medical implications. One man, however, thought money. He proceeded to buy the firm's stock which, sure enough, jumped as soon as the news of the discovery became public. The rest of us never once thought of purchasing the stock—we weren't money-minded!

Consider Stephen W. Harris, who was leafing through a pamphlet one day when his eyes lighted on an item citing a big boom in mustache wax. Others smiled and forgot about it—not so Harris. He investigated, learned that these wax sticks were being used by teen-agers to stiffen up their crew cuts. Not long after, Harris came out with Cru Butch Hair Wax, one of the hottest products in the hair preparation field today.

● *They have one-track minds.* For years the Institute for Motivational Research at Croton-on-Hudson, N. Y., headed by the famous Dr. Ernest Dichter, has been studying why some firms and individuals are successful and others are not. Irving Gilman, executive director of the Institute, reveals that one prime reason stands out above most others: Absolute refusal to be diverted from a selected goal.

Mr. Gilman cites the case of George Romney, president of American Motors. Romney, he says, had an idea for a small car, the Rambler. It came to him back in the days when all the motoring industry talked of was bigger and fancier automobiles, wider and roomier and plushier. Romney met bitter opposition but he refused to be diverted. He convinced his associates in American Motors, and eventually everybody else, that the compact car had a future. Romney's pursuit of his single goal not only won him great personal success but revolutionized automobile tastes in the United States.

"Persevere and you'll succeed," promised the Horatio Alger books. This seems to be true. With perseverance you need not be brilliant, nor even a good "idea man." *One* fairly good idea will put you on the road to riches.

Henry Ford was essentially a one-idea man with a one-track mind. So was Adolph Levitt, who devoted his life to creating an automatic doughnut machine that made the doughnut a national institution. And what better example of a one-idea man is there than Col. Lewis Walker?

The colonel's brain fastened leech-like on a gadget originally thought up by an inventor named Whitcomb L. Judson. The inventor quit but the colonel wouldn't give up nohow—and 25 full years were to pass before he finally got what he sought—a machine that manufactured zippers.

● *They have the gambling instinct.* Caution is not their watchword. Prudence is not their middle name. On the contrary, they are ready to risk the whole works on a single roll of the dice.

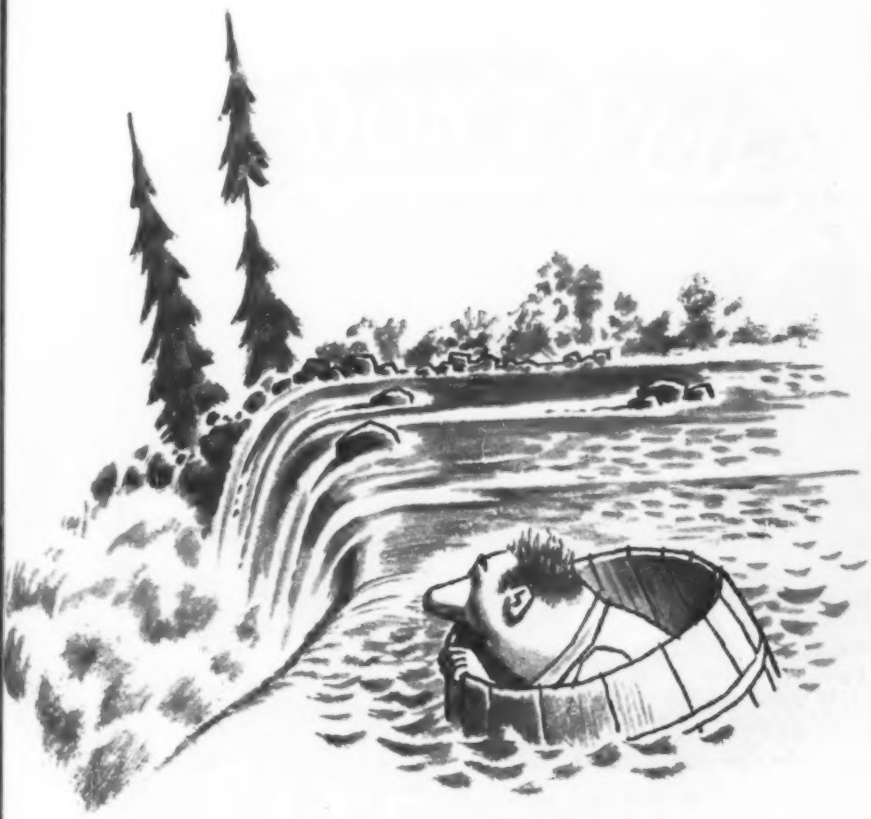
Joseph P. Kennedy, father of Presi-

dent John F. Kennedy, has again and again taken long chances in real estate deals—and cashed in. Now his fortune is reckoned at around $300,000,000. Jerry Wolk, mainspring of All-State Properties, Inc., one of the country's biggest realty empires, once hocked everything he possessed and gambled the wad on a single deal. It paid off and today his company owns more land than several European countries put together.

Gambling instinct of another kind was exhibited by Charles W. Lubin. Most businessmen, he knew, try to achieve success by selling something cheaper than anyone else. Lubin, however, decided to buck the tide—he invested heavily in making a product that would cost *more* than its competition! He baked cakes, good ones with more costly ingredients, but they were frankly expensive. He won the gamble—the customers bought them. You've heard of his product—Sara Lee cakes. Not long ago, Lubin sold his business to Consolidated Bakeries for $25,000,000. Clearly, it paid to gamble on a conviction.

There is a wide gulf between the successful business man who has the guts to take a chance, and the habitual gambler. Explains Dr. Hoffmann:

"The successful man always controls his gambling—it never controls him. He plans his move carefully in advance, weighs the [*Continued on page* 161]



the AMPHICAR

FOR WET pavements, really wet, you merely turn off wheels, flip on propellers, seal doors.

BILGE PUMP, in case you ship water, is electrically operated, squirts water astern.

TWIN PROPS for water going can't be seen by casual passerby. Note seagoing bottom.

This West German rig is at home on land or water and will be sold in the U.S. for $3,400.

APPEAL of this one, says our car critic, is to outdoorsmen, water lovers, car lovers, blondes.

By Tom McCahill

EVERY once in a while a vehicle comes along designed purely for fun. The Amphicar is one of these. The manufacturers like to call it a sports car that swims—a statement no one can deny. In a nutshell, the Amphicar is a small automobile that floats and has propellers to drive it when it is in the water.

To say it is a fine boat or a great sports car might cause a considerable delay in the delivery of my George Washington truth suit. But the Amphicar is a fun machine from every angle and though I've been in much better boats and much better cars, buying one of these two-way rigs would be similar, let's say, to marrying a moderately good-looking girl who makes $80,000 a year catching for the New York Yankees. This package is versatile and should prove especially handy if you miss the last ferry or if the bridge falls down.

In many ways it reminds me of a refined Aqua-Jeep. The Aqua-Jeeps were used with mixed emotions and success in many World War II campaigns. I remember one of the first Aqua-Jeeps I ever saw. It was during the war and an ordnance officer decided to demonstrate its prowess. He planned to drive it off a dock (six feet above the water at high tide), shift to propeller drive, cross a mile-wide body of water (on top) and emerge by wheel drive on the far shore. The press was invited and so were the photographers. A small ramp was built at the dock edge to give the Jeep a lift as it took off—

REAR-MOUNTED engine is water-cooled—note radiator and fan on starboard side.

HORN, for yachts and stickball players, is outside waterproof, sound-killing hull.

UP FRONT are gas tank and spare wheel. There is space for tools—but no luggage.

the plan called for a spectacular splashing leap. The demonstration was delayed almost three hours waiting for some important army brass to arrive—and this proved somewhat disastrous. The tide dropped about five feet during the wait which meant an 11-foot drop from dock to water surface. But the demonstrating officer was true to the uniform—though stupid—and away he went.

The Aqua-Jeep shot off the dock into space like a bird but landed nose down like a deranged fish. There were lots of bubbles and then a head appeared above the surface—but no Jeep. All film was immediately taken from the photographers by security police and, as there was a war on, the reporters were forbidden to write one word about it. Regardless, I'll bet someone has a picture they managed to hide and if he reads this I'd sure like to [*Continued on page* 154]

TEST CAR SPECS

MODEL TESTED: **Amphicar**

ENGINE: **4** cyls; **43** brake hp; **51** ft-lbs max torque; **8** to **1** compression ratio. Bore **2.76** ins; stroke **3** ins. Fuel required: **Regular.** Freeboard: **21.2** ins. Wheelbase **83** ins; length **170.4** ins; height **58.8** ins; width **61.2** ins; front tread **48** ins; rear tread **50** ins. Weight **2,240** lbs. Gas tank capacity **10.8** gals. Turning circle diameter **32** ft. Tire size **6.40X13.**

PRICE (without optionals): **$3,400.**

THERMAL HAND SPRAY to keep fingers warm and working without the clumsiness of gloves. Chuck Nielson, Unionville, Conn.

FOLDING SHELF at side of filing cabinet to hold papers that are to be filed, free hands for filing. C. E. Brezina, Omaha, Neb.

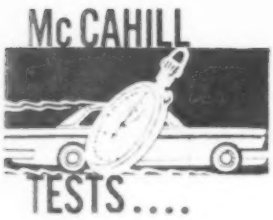
CLOCK RADIO that tells hours in words (on magnetic tape)—to save time, prevent losing count. Betty Harris, Baltimore, Md.

INVENTIONS WANTED!

Is there a gadget you think should be invented? If so, send its description on a postcard to Inventions Wanted Editor, MECHANIX ILLUSTRATED, 67 West 44th St., New York 36, N. Y. Each one printed will be awarded $5. Entries not selected cannot be acknowledged or returned.

PERISCOPE for little cars to peek over tops of oversized Detroit iron, hedges, etc. George F. Corcoran, Waterbury, Conn.

RETRACTING SLING that rolls up into stock of rifle—for carrying at ready in the woods. Charles Juenemann, Yamhill, Ore.



THE CHRYSLER NEWPORT

"It looks like a much more expensive car—and it performs like one, too."

By Tom McCahill

AS John L. Sullivan said to Jake Kilrain, as he bounced him off the wall, "Good things come in big packages, too, an' yer not apt to forget it." The Chrysler Newport is a good big car at a comparatively low price and it's chock full of little goodies for the big-car fan with a low-tide wallet.

As you know, Chrysler cars come in as many sizes as brides do, ranging from the speed trial champion

CHRYSLER styling is obvious; you'll have trouble telling it from larger models, the Windsor and New Yorker.

TEST CAR SPECS

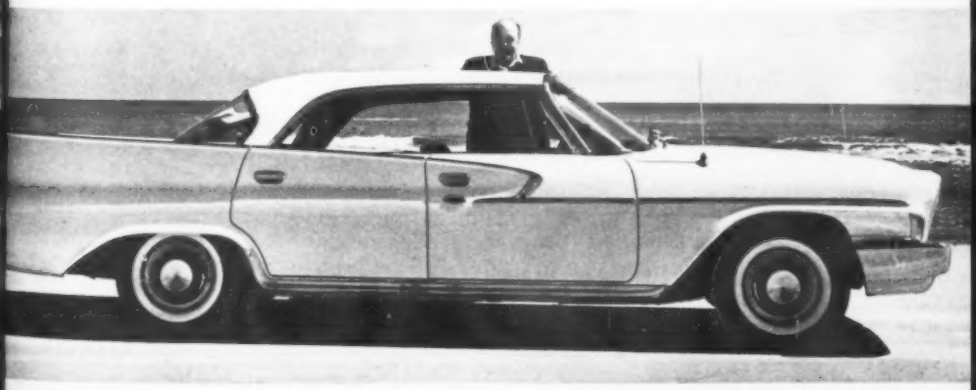
MODEL TESTED: **Chrysler Newport four-door hardtop**
ENGINE: **V8** cyls; **361** cubic ins; **265** brake hp; **380** ft-lbs max torque; **9** to **1** compression ratio. Bore **4.12** ins; stroke **3.38** ins. Fuel required: **Regular.** Standard axle ratio: **2.93.** Wheelbase **122** ins; length **215.6** ins; height **54.9** ins; width **79.4** ins; front tread **61** ins; rear tread **59.7** ins. Weight **3,730 lbs.** Gas tank capacity **23** gals. Turning circle diameter **44** ft. Tire size **8.00X14.**
PRICE (without optionals): **Approximately $3,000.**
PERFORMANCE: **0-30** mph, **3.9** secs; **0-60** mph, **10** secs; **40-60** mph, **5.1** secs. Top speed **110 plus** mph. All times recorded on corrected speedometer.

300 down to the New Yorker, Windsor and, at the bottom rung, the Newport The price range also goes the whole route. This is why we decided to give the economy kid a whirl. The Newport rests right in a hot bed of medium-priced competition—and at the low end of the medium-priced rigs at that. Its immediate rivals are the Pontiac Catalina, Olds Dynamic 88, Mercurys and some medium-grade Buicks.

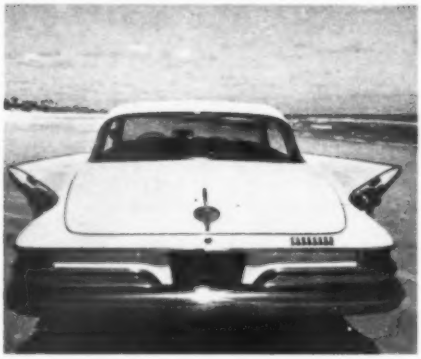
Delivered in Florida with heater, radio, whitewalls and all the deluxe gook, aside from air conditioning, this car in a full cream puff suit will be left at your door for a hair over 3,700 of Uncle Sam's green trading stamps. In a skimmed-out version as austere as love on a scooter, without extras, you could slice $600 to $700 off the price or go the other way and, getting all the gadgets plus air conditioning, be forced to shell out over $4,000. Though this is not cheap by ten-years-ago standards in today's rat race its's a bargain.

My test car was delivered by the Atlanta Chrysler Zone and I still haven't figured out why it came through with Alabama plates. As usual when I keep a test car for some time, little facts pop out that are impossible to detect or fully realize in a short one-day go. For example, the standard Newport is powered by a 361-cubic inch V8 engine, the same as the Windsor. The big New Yorker has a 413-inch mill, the same as the 300, with a compression ratio of 10.1 to 1. The Windsor, with the same base engine as the Newport, sports a 10 to 1 ratio but the Newport has a comparatively low 9 to 1 set of heads.

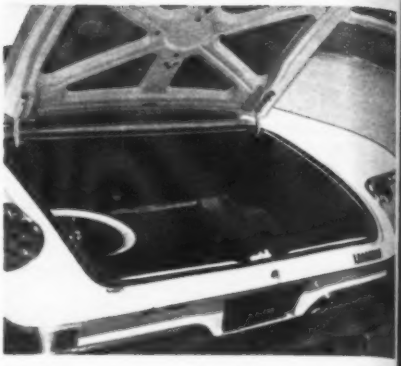
This means the Newport can successfully sidle up to the lamp oil, or low-octane pump, while all other Chryslers, including the Windsor, must stop at the high-priced spread. This fact alone can mean as much as one buck's difference every time you gas up.



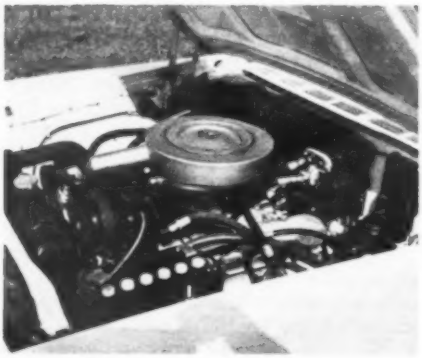
ECONOMY Newport is not a small car—overall length is 215.6 inches, wheelbase 122 inches.



REAR DECK is ribbed, with flaring fins and squared-off tail and bumper styling.



TRUNK is roomy and this plus use of regular gas makes Newport fine for touring.



STANDARD engine is 361-cu. in. V8 but you can get it with 300 or New Yorker mills.

HANDLING and suspension were excellent. Uncle Tom says—"strictly big car stuff."

The test car didn't have the extra-cost six-way power seat and as I must drive with the seat all the way back I felt as though I was sitting in a mole hole. A great big paper sign attached to the sun visor advises that the seats in addition to the regular back and forward jazz, can and will be custom-fitted for pitch and height to your posterior by the dealer at no extra cost. If you are six foot six, married to a five-foot-two wife, better buy her a six-way power seat or a bike.

The Newport is rated at 265 horsepower which our test proved was more than adequate for the average family. But if you were sired by Man O' War and your brother was Count Fleet there's another page in the Newport for you. At extra cost (about $200) you can order the slightly lighter and slightly shorter Newport with the New Yorker engine. If you are really a foam churner you can also order it with the full 300 engine and let the trees stand aside. The Newport with a big, high-performance engine will just about out-drag anything on the road except another Chrysler product, the Plymouth, which can also be bought with the big Chrysler atom-smasher.

Back to the Newport in its regular suit. Sizewise, it's a big car. The wheelbase is 122 inches, and overall length is 215.6 inches and the width is 79.4 inches. [*Continued on page 15*

EVEN a protective suit can't hide MIMI—if it's a demonstration suit, made of clear plastic to show off what's inside. Besides MIMI, please note back pack and plastic hose that carries cool air to extremities. Pack holds storage unit to supply breathing air, quantity gauge, ejector for circulating air, heat exchanger for cooling recirculated air, trap for solids and moisture. Air-conditioned suit enables workers to carry on while handling missile fuels, on rescue work, in outer space. Production suits will be opaque. Garrett Corp., Los Angeles, Calif.

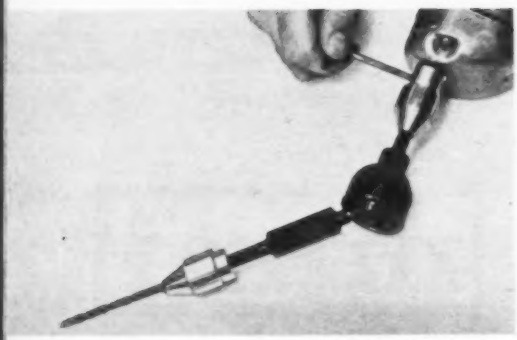
mimi

BRIGHT IDEA AWARD MECHANIX ILLUSTRATED

GYRO-DRIVE

THIS month's Brightie is a drive that converts any powe drill into a variable-angle tool. It's the Gyro-Drive made by Glenwood Gyro-Drive, Inc., Glenwood, Min List price, $8.89. The drive can be mounted directly in any drill spindle with an adaptor (29 cents) or can b slipped into the drill chuck. Business end has a thread sleeve to take either a quarter-inch or half-inch chuck. removable hand-grip bar, not shown here, is used for apply ing heavy pressure. •

SIMPLE—when you have the rig tool. Hard-to-get-at drilling jobs lik this are a cinch with a Gyro-Drive mounted on any standard drill



DRIVE can be slipped into drill chuck with an additional chuck on the operating end.

WIN $50

MI will award $50 each month to the first person who tells us of a new and useful gadget that is patented and in production. Manufacturers are also eligible for this award. Pictures and a description should be sent to Bright Ideas Editor, Mechanix Illustrated, 67 West 44th Street, New York 36, N. Y.

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PART I

HOME MOVIE-TAKING MADE EASY

By A. I. Schutzer

(Editor's Note: This is the first part of a two-part article on making home movies. The second part will appear in the July issue.)

TODAY some 4,875,000 amateur photographers in the United States are taking home movies of their families and friends and anybody else who's ham enough to look a camera lens in the eye. Each year about 300,000 new 8mm home-movie fans sally forth, camera in hand.

Making your own home movies can be an exciting and rewarding experience. The basic equipment required is a camera, a projector and a screen.

CAMERAS...

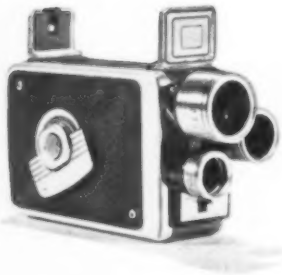
FAIRCHILD 8mm sound movie camera with mike and headset lists for $239.50. "Lip-synched" camera is transistorized.

BELL & HOWELL Zoomatic with Westinghouse sealed beam flood lamp. $259.90.

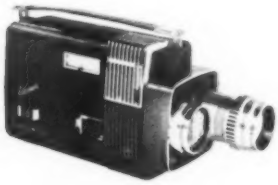
Various accessories can be added as you go along. A new home-movie fan can equip himself for as little as $73.95—the cost of a Kodak Brownie 8 camera, Brownie projector and 22x30-inch Brownie screen. If money is no object, $796.50 will cover the cost of the Bolex H-8 DeLuxe with Pan-Cinor 30 zoom lens, and the Bolex M-8 projector with Sonorizer sound attachment.

Here, for the benefit of MI readers contemplating making their own 8mm home movies, is a survey of the equipment available. Let's start by taking a look at 8mm film—the raw material of your movies.

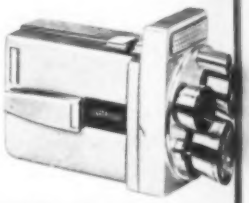
Film for 8mm cameras is, strangely enough, not 8mm film. It is 16mm film with special perforations that match 8mm camera equipment. You cannot run ordinary 16mm film through your 8mm camera. The special 16mm film is called "double-8mm" and is ordinarily supplied in 25-foot lengths. You run this film through your camera twice. After a roll of double-8mm has run through your camera once, it will be on the take-up spool with one-half of its width exposed for the entire length of the film. You remove the take-up spool, turn it over, load it in the feed position and run the film through the camera again, making pictures on the previously unexposed half of the film. You have produced two side-by-side strips of movies, each 8mm wide, each 25 feet long.



BROWNIE turret camera makes regular, telephoto, wide-angle shots. $59.50.

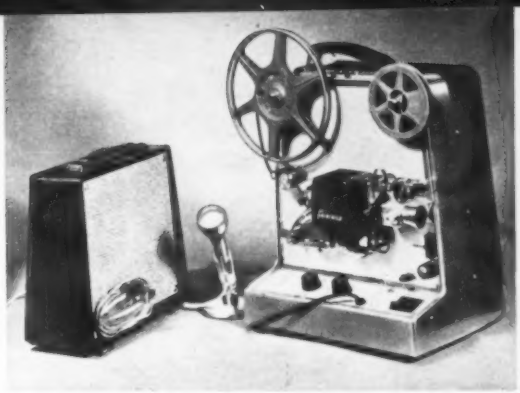


WHITTNAUER Cine-Twin Zoom-800 movie camera is its own projector. $259.

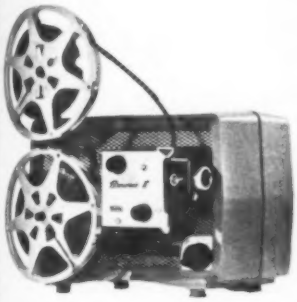


ARGUS Cinetronic camera has automatic electric-eye exposure control. $119.95.

PROJECTORS...



FAIRCHILD'S Cinephonic 8mm sound movie projector is companion to the lip-synchronized camera. $249.50.

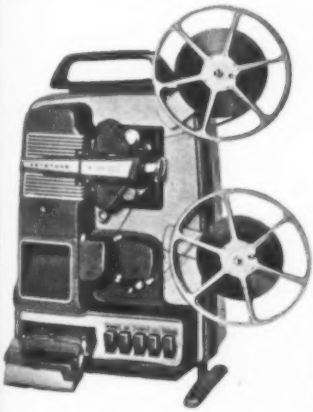


BROWNIE 8 (Model A15) self-threading projector throws a four-foot-wide scene. $54.50.

After processing, the double-8mm is slit down the center, spliced end to end and returned to you as a 50-foot length of film, perforated on only one side of the film. Each picture or "frame" of 8mm film is half the width and half the height of a standard frame of 16mm film.

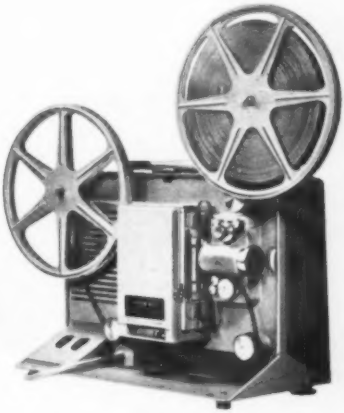
Twenty-five-foot double-8mm film is supplied on spools or in magazines. The spools are 16 per cent cheaper and cameras using spooled film cost less than cameras using magazines. Spooled film must be led through a film gate and fed into a take-up spool. Film in magazines features easier "drop-in" loading but sometimes has a tendency to jam.

Nearly all home movies (98.5 per cent) are shot in color. The difference in cost between color and black-and-white is negli-[*Continued on page* 162]



KEYSTONE K-110 Auto-Thread zoom projector has a motorized Action-Editor. $220.

BELL & HOWELL'S Dual/Lectric projector is fully automatic—it even turns off room lamp. $239.95.



ARGUS M-500 projector has quick control lever to stop, advance, reverse film. $84.95.

INVENTOR Janis shows the new Iro-Case line of canvas luggage to an interested visitor.

THE MAN WHO WOULDN'T QUIT

By Duane Bradley

DO you have an invention worth big money if the breaks come your way? Then you ought to know about Andrew Janis of Manchester, N. H. Andy is an inventor who developed and followed a seven-point plan to control the breaks while exploiting his idea.

Janis was in the Navy when his big idea hit him. It occurred to him that travelers—especially women—invariably complain that their clothing is always wrinkled when they unpack their suitcases. Andy approached the problem directly: "Wrinkled clothing needs to be ironed." Hence he reasoned travelers needed a small, compact, efficient iron which would travel with them. And what could be better than an iron which was not something more to pack and carry but was a part of the suitcase itself?

That was the beginning. The first step is the idea. This must be a practical answer to a real need. Andy's iron had to be a small lightweight made of a durable and inexpensive metal, and it had to be easy to carry and use. This last requirement led him to the real innovation in his idea: both iron and suitcase would share the same handle, and the iron itself would fit snugly into a heat resistant shoe built into the suitcase.

PATENTED wood model of iron (left) cost 16 cents to design, final product (right) $61,000. Center iron was discarded design.

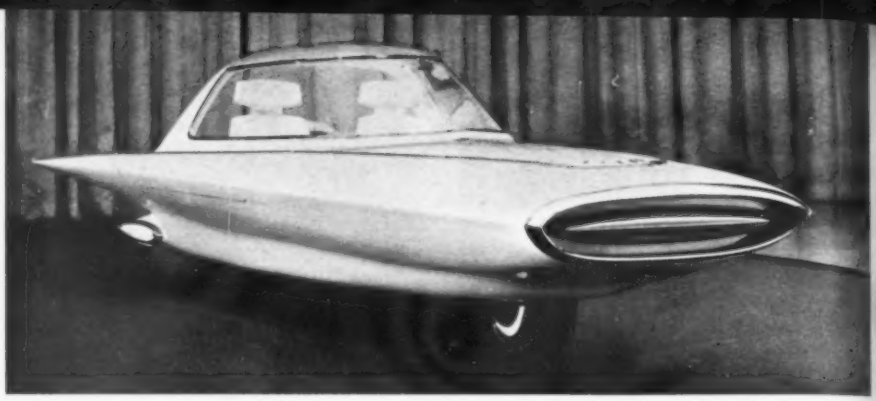
LEFT, Iro-Case with iron removed from grip. Attached, it's handle of suitcase.

Andy was tempted to submit his idea to a big manufacturer but decided against it. Subsequent events proved him correct, which leads to another bit of advice he would like to pass on: "Don't depend on anyone else to see the possibilities of your basic idea or to do the work it will take to make it successful."

Andy decided on aluminum as the best metal to use for the iron because of its light weight and low price compared to other metals. The present iron's heating element is small, costs little to produce and raises the heat of the iron to 450° in three minutes.

Immediately he christened his invention Iro-Case [*Continued on page* 157]

IRO-CASE looks like any smart piece of luggage. Its magic shows up when the traveler removes the handle and irons with it, using suitcase for emergency pressing chores.



FORD'S NEW TWO-WHEELER

DELTA-SHAPED Gyron would run on two wheels in tandem. Ford Motor Co. advanced stylists, who developed the car, envision use of a gyroscope for stabilization. Retractable outrigger wheels near rear of car would lower automatically to balance the vehicle when gyro was inactive. A control console separates the car's two seats. Guidance system is a steering dial with separate rings for automatic speed and steering control. Infra-red "snooperscope" would give driver a clear picture of the road in any weather. It is thought the car could also lend itself to new power sources, such as fuel cells. No plans for production, the Gyron is strictly for dreaming. •

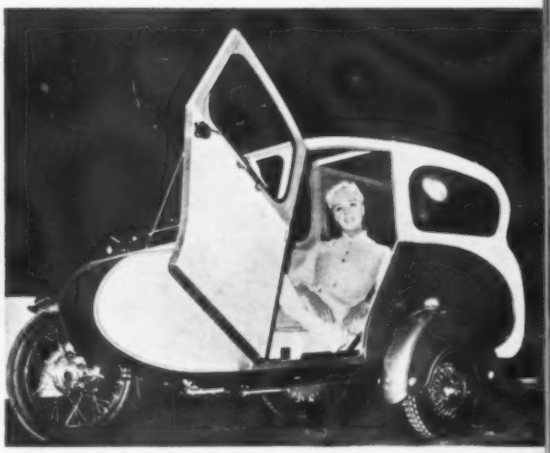
CHRYSLER'S NEW GAS TURBINE

THIS entry in the experimental car field is Chrysler's Turboflite. Powered by a gas turbine engine weighing half that of a conventional V8 engine, the T-Flite is all speed, power and luxury. Innovations include a canopy that automatically rises when either door is opened, deceleration air-flap suspended between two stability fins and retractable headlights for day driving. The nighttime interior of this four-passenger jewel is bathed in a soft aqua glow of electroluminescent lighting. The instrument panel includes a pyrometer to measure temperature at air intakes of the engine, a tachometer, speedometer, ammeter and fuel gauge. This job too is like—later, man. •

IT'S NEW!

SWEDISH HYDROCOPTER scoots over water, snow, ice at speeds up to 60 mph. The glass fiber craft's air prop is powered by a Volkswagen engine, $2,500.

NAVIGATIONAL flight simulator takes engineer William Luton on many a "trip" to outer space. The device can theoretically launch, orbit, re-enter a space vehicle.



EVEN ROYALTY wouldn't snub this motorcycle sidecar. It's British-made Watsonian Swallow Super Comet, long enough for a passenger to lie down in and go to sleep.

CONTINUED . . .

VOLGA station wagon is one of the most modern designs yet produced in the Soviet Union. The car is powered by a four-cylinder, 70-hp aluminum engine.

PORTABLE scooter folds up for storing. Weighing only 84 pounds and powered by a one-cylinder engine, it seats two, can do 35 mph and go 165 miles on a gallon of gas.

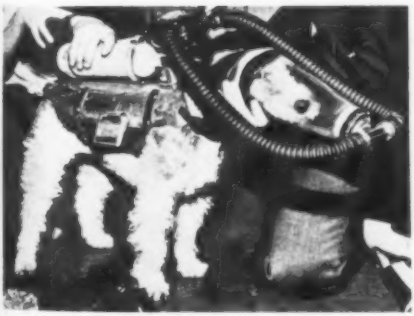
DIESEL marine outboard engine develops seven brake hp. Designed to power 16 to 40-foot boats, it uses no more than 3½ pints of fuel oil per hour at full speed.

Woolson Marine, Ltd., Buckinghamshire, England

ROBOT MOWER works by remote control. Invented by two American engineers, it replaces 90 per cent of the handwork formerly required.

TYPING student is using a tutor typewriter with hooded keys and a keyboard panel that lights up when the correct keys are touched.

VISIONARY Donald Andrus, 17, devised this battery-operated wiper assembly to keep his eye glasses cleared of snow, rain and sleet.



SCUBA POOCH sports underwater breathing apparatus designed for him by his master, Sven Nahlin, Swedish frogman instructor. Dog has stayed submerged up to 20 minutes.

SCHUSS CHUTES promise happier landings for beginner skiers. They're designed as braking devices to help hold skier upright and to check his speed down steep slopes.

SPECIAL SECTION . . .

Vacationing IN A TRAILER

15-FOOT trailer rents for about $30 a week, sleeps five, has an icebox and butane stove.

By James Joseph

LAST August John Needham of Indianapolis, his wife and three kids (ages six to 12) returned home suntanned and triumphant after a week in the woods.

"Greatest vacation ever," Needham told a welcoming neighbor. "And we spent less than $90!"

The Needhams, like a lot of other folks, had discovered the "vacation trailer." Bundling his family into the car, Needham had driven to Detroit. There he rented a trim little 15-ft. travel trailer complete with dinette, running water, refrigerator and canvas-roofed patio. Hitching up, he pushed into

16-FOOT, two-deck trailer costs about $50 a week to rent, will sleep eight.

VACATIONING in a travel trailer—a wonderful way to see the country on a limited budget.

Michigan's vacation wonderland. For six leisurely days the Needhams lived on a lakeside in Huron National Forest. Like the 149 National Forests in 44 states and Puerto Rico, Huron beckons to the trailerite with rental-free campsites.

The Needhams fished and swam when they felt like it, without once worrying about a motel's check-out time. Nor did they have to jostle for tableroom in jam-packed resort restaurants; not for them the wiring ahead for each night's lodging.

Vacation over, they returned the trailer to its Detroit owner (one of America's 4,000 trailer dealers), paid the modest $30 rental (plus another $4 for the bumper hitch) and, unencumbered, headed for home.

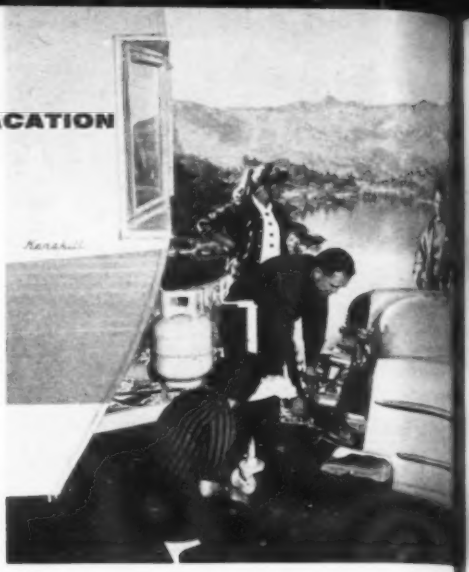
The Needhams' discovery was shared last year by an estimated 25,000 families who vacationed for the first time in rental trailers. They camped along Mexico's sleepy byways, towed their trailers up the Alaska Highway, set up housekeeping in hundreds of parks, ventured into scenic wilderness spread from Canada's Rockies to Florida's Everglades.

Hundreds more traipsed to Europe where, renting both car and trailer for as little as $70 a week, they saw the Continent from their own doorsteps.

The average vacation paycheck will amply cover the $70-$100 cost of a no-

ONE FAMILY'S TRAILER VACATION

ENGINEER James Bowser, his wife Elma and two daughters, Karen and Jolene, have taken trailer vacations for years. Shown here is their trip to Convict Lake in Inyo National Forest, Calif. They paid $40 a week for a 15-foot trailer with double beds and a shower, refrigerator and stove.



UNHITCHING is done at picture campsite overlooking the lake. Hitch is rented with trailer.

REFRIGERATOR helps Elma Bowser feed her family on $4 a day.

HOW to keep food budget down? Go fishing—and hope for good luck!

FOUR-BURNER butane range is great for fresh trout from Convict Lake.

AND SO to bed—which makes up into divan in the daytime. And their campsite is rent-free!

madic week by lakeside or seashore. Most rental trailerites return home with money to spare.

"Vacations haven't cost us a cent during the past ten years," says James Bowser, a Lockheed engineer who, with his wife and two daughters, rented his first vacation trailer back in 1948. Bowser figures that he actually *earns* $100 every week he vacations in California's High Sierras. That's the difference between his vacation paycheck and what he spends camped beside Convict Lake in Inyo National Forest. The lake is flanked by two-mile high Mt. Morrison and is a wilderness—and a truly woolly location unless you have the forethought to carry your cottage with you.

Comes vacation day, the Bowsers pick up their cottage. Thirteen-year-old Jolene packs aboard a box-ful of candy bars (the chipmunks love them) and Karen, two years older, hopefully stows her phonograph and records—for although their cottage is wired for electricity, few wilderness areas have powered campsites.

"Ten minutes after we've hitched up," says Jim, "we've loaded aboard bedding, clothing, two weeks' supply of grub and one of those camper cook sets—complete with nested cups for four and a couple of skillets. It's as simple as that."

Jim finds the towing no trick at all. Nor does a trailer, as some claim, play hob with your car's transmission. Today's trailers are so carefully engineered that your bumper carries less than 200 lbs. of the 1,500-lb. load—the weight of an adult sitting in the back seat.

Only once—during their very first mobile vacation—have the Bowsers run into trouble. Laboring up a mountain grade, the car's engine quit and, trying to pull to the shoulder, Jim jackknifed the trailer.

"There we were at 10,000 feet," laughs Bowser. But at the time nobody laughed. "The next year," recalls Jim, "I rented trailer brakes. Most states don't require them on 15-ft. trailers but I wouldn't push into really rugged country again without them."

Few of today's trailer renters ever set up in established trailer parks. They camp by lakeside, relax in National Parks (most of which welcome the trailer vacationer), or poke into out-of-the-way scenic places where, without their trailer, they'd find neither bed nor board.

A National Park superintendent estimates that fully 25 per cent of the trailers encamped in his domain are rented—usually from nearby towns. "For most," says this same Park man, "it's their first experience in a trailer."

Usually, you can rent your trailer within easy driving distance of lake or stream. Suppose you live in St. Louis and hanker to take to the Minnesota woods. You reserve a trailer in Minneapolis, pick up your rolling cottage when you arrive in the Twin Cities and, at vacation's end, return it to the local dealer. The pickup-nearest-your-destination plan is ideal for the family that wants to lug a little and loaf a lot.

"But," warns a rental dealer in Los Angeles, "if you're on a really slim budget, you'd better add up the mileage before writing ahead for a trailer. You might find it cheaper to rent your trailer at home—and bring it with you."

The rental trailerite quickly discovers that he travels in a world of special privilege. Some of the globe's choicest vacation sites (from Alaska to the British Isles) have been commandeered by the trailer clan.

Headed overseas, you can join Britain's Caravan Club (address: New Oxford House, Bloomsbury Way, London, W.C. 1) and pick and choose from 250 campsites, for mobile members only, scattered from Dover to Dundee. Included with your "Overseas" membership (cost: $6.88) is a listing of 500 Continental trailer sites, scattered through France, Germany, Italy, Spain and Switzerland.

For in- [*Continued on page* 167]

SAILBOAT TRAILER

Designed for the Snipe Class sailboat, it's easily adapted for any boat of similar size.

By Jim Young

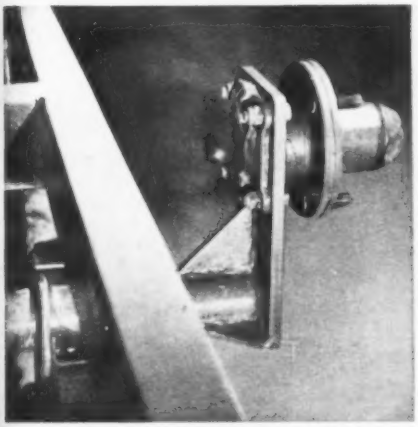
THE Snipe for which this trailer was built is 15½ feet with a five-foot beam and weighs about 425 pounds. With only minor changes, the trailer could be built for any boat of similar size and weight.

The trailer has several advantages. Large wheels make handling easier on sand and rough roads and the tires and bearings last longer. An underslung axle allows the boat to be carried between the wheels, lowering the center of gravity for better roadability and also facilitating loading and launching. Not

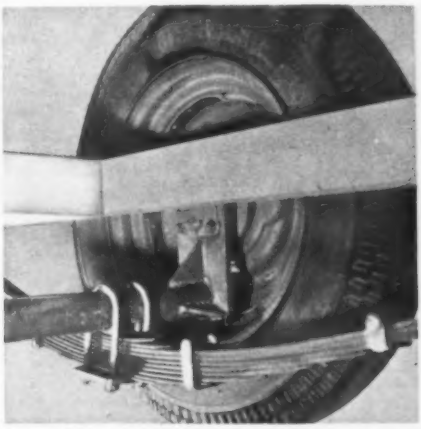
of least importance is the cost. It was only $78 in my case, including professional welding and new tubes and tires.

The wheels on the trailer shown are from an English Hillman and the springs are from an Italian Fiat. The Hillman springs are quite satisfactory; I just happened to have those from the Fiat. The wheels are procured with hubs, spindles and brake drums. This is best done by removing the kingpins from the suspension, disconnecting the steering arms, cutting the brake hoses and walking away with everything that falls off. Some parts are useless to you but they're also useless to the wrecker and he won't charge any more for them. The springs are removed with rear shackles attached.

Remove the wheels complete with hubs and brake drums by pulling out the cotter pins and unscrewing the retaining nuts. Then clean the inner seals and bearings and examine them for wear. Discard all other parts but retain the spindles. The kingpin bosses

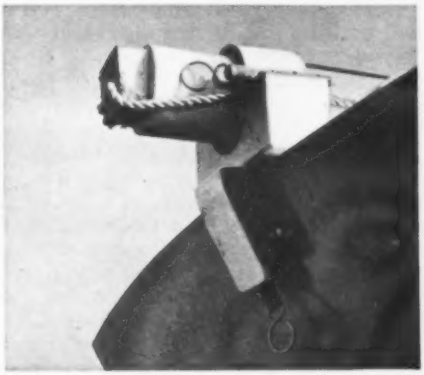


SPINDLES from a Hillman are bolted to end plates which are welded to the axle.

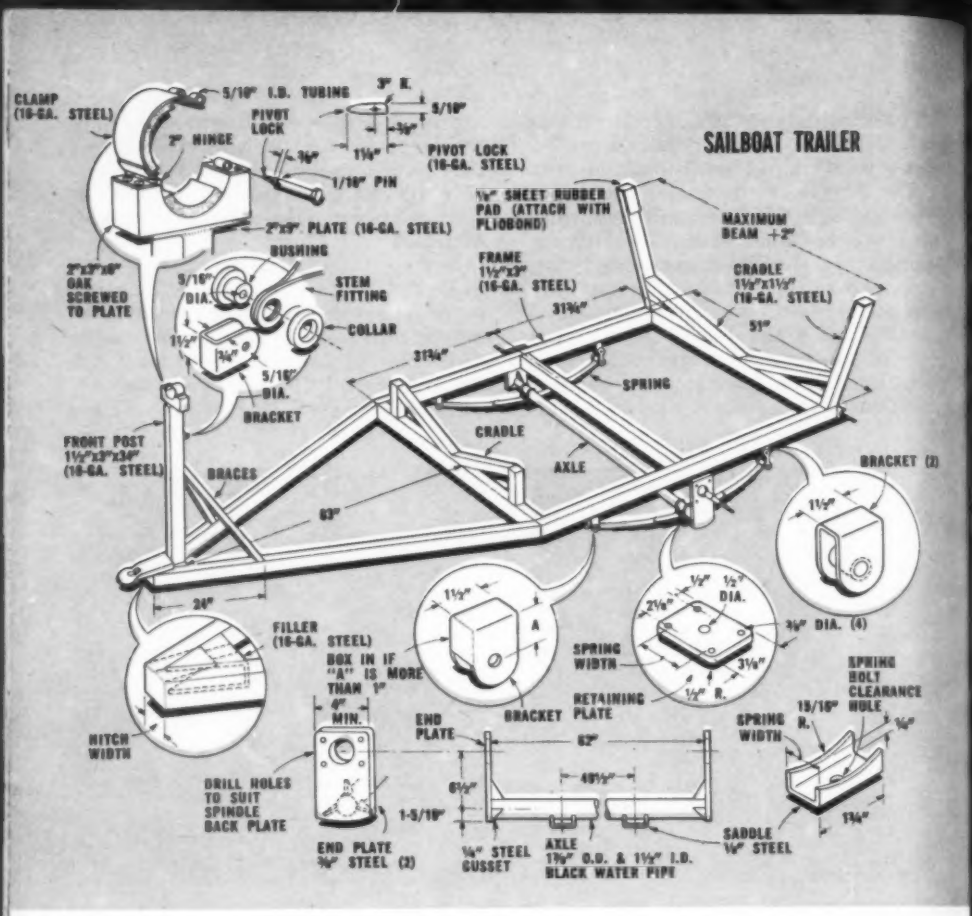


U BOLTS and a center bolt secure each spring between retaining plate and saddle.

UNDERSLUNG AXLE allows low center of gravity, better roadability, easier loading.



REAR mast clamp has padded metal base, is pinned to top rudder gudgeon on boat.



are cut off the spindle backplate with an oxyacetylene torch.

Each wheel and brake drum is removed from the hub by unscrewing the wheel nut. The Hillman wheel studs are shouldered, the depth of the shoulder being equal to the thickness of the brake drum. For this reason a spacer of the same diameter as the hub has to be cut from the brake drum. Do it with the torch or drill a series of holes with the edges nearly touching and cut through the intervening spaces with a hack saw, cleaning the edges with a file.

Now make the end plates from cold rolled mild steel with the large hole just big enough to give clearance for the spindle. Then position the spindles on the end plates, mark off the attachment holes and drill them. The end plates and mild steel gussets are then welded to the axle. The welder should know his business or you'll end up with unwanted camber, toe-in or toe-out. After welding, the spindles are attached with bolts and self-locking nuts.

To mount the hubs on the spindles, first fit the inner seal and then the inner bearing. Then pack some wheel bearing grease into the hub, fit the hub, the outer bearing, the washer and the nut in that order. Tighten the nut just enough to remove all end play from the bearings, then back it off to align a slot with the cotter pin hole. Insert a cotter pin and fit the cap with some wheel bearing grease inside.

For attaching the springs to the axle, first make the saddles from mild steel. Then thread the ends of ⅜-inch rods for the U bolts and bend the pieces to the contour of [*Continued on page* 136]

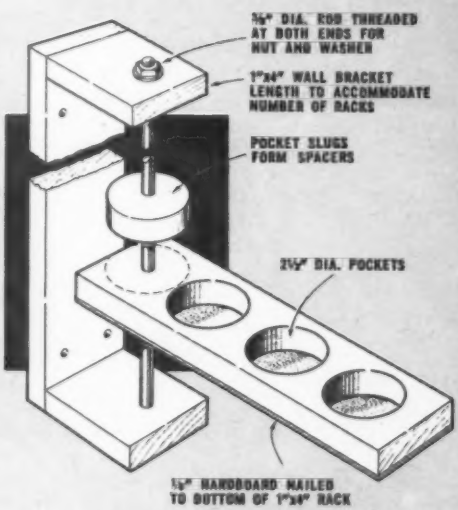
SMALL PARTS RACK

Keep that small hardware ready at your fingertips.

By Jim Bush

THIS rack can be built from scrap materials. For the trays use 1x4 pieces long enough for four circular holes 2½ inches in diameter. Make three holes with a saw-type cutter on your drill press. Leave enough space at one end for the necessary spacer. The cut-out circles are used as spacers. A piece of hardboard nailed to the bottom converts the piece into a tray. Drill spacers and tray ends with ⅜-inch holes for the supporting rod bolted at each end to the wooden bracket. The bracket holds the rack to the wall. Its height and the rod's length depend on how many trays are needed in a rack. •

HARDBOARD bottom is nailed on after the circular pieces have been cut out.



PARTS RACK CONSTRUCTION DETAILS

MI BUILDS A GARAGE

By J. Robert Connor*

You can build this spacious 14x25-foot attached garage for approximately $1,000.

ASSUMING that you have the space on your property, you can build an attached garage at savings of approximately 50 per cent if you're willing to tackle the work yourself. The garage shown here, a 14x25-foot unit, consists of a concrete slab with a 36-inch deep footing, a vestibule to the house with a large closet and a sliding door leading into the garage, and a door at the rear of the garage which opens onto the patio. The total cost of construction materials for this spacious addition came to less than $1,000. This includes the slab, lumber, electrical equipment and paint.

Once you have decided on the structure you want, have

* The builder, Mr. Connor, is Assistant Editor of this magazine. He lives in Glen Cove, a suburb of New York City, and is keenly aware of the problems that plague all suburbanites.

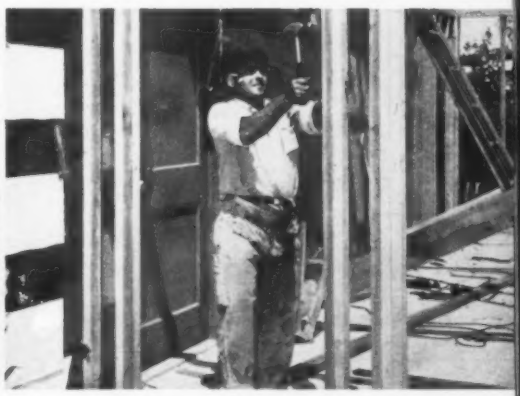
SHED was torn down, garage site cleared. Footing was then dug for concrete slab.

FORMS for concrete were installed after area was staked out. Forms must be level.

CONCRETE dumped by truck is raked over the site. It must be level with form boards.

SCREEDING. Straight-edge 2x4 makes cement fairly smooth. It is finished with trowel.

FRAMING is important. Here 2x8 header is nailed in to form frame for garage door.

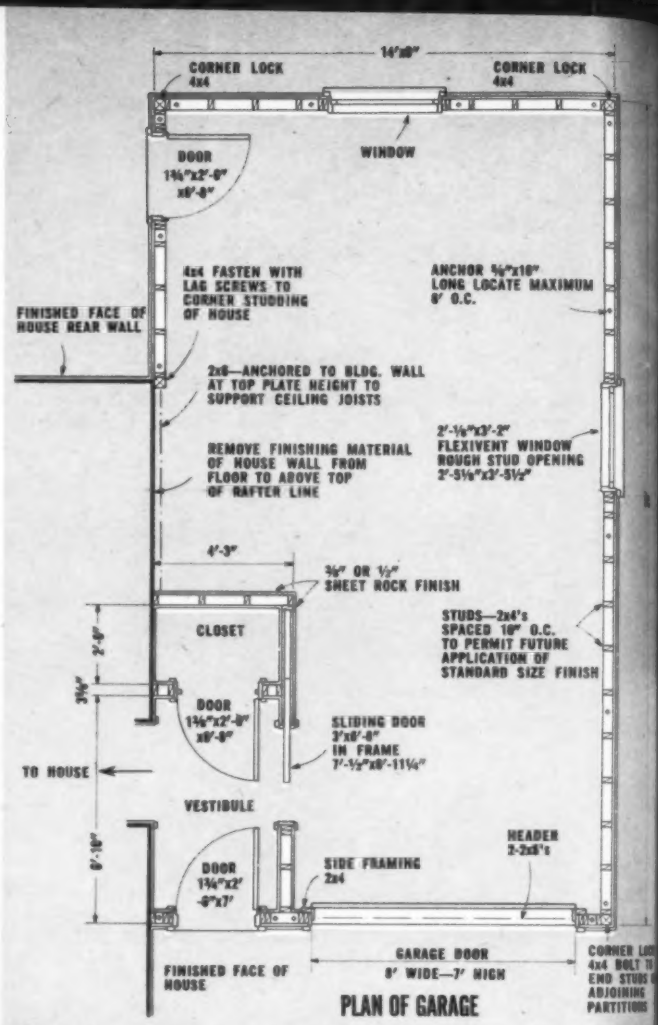


DOOR frames and windows are braced with double 2x4s on each side of the opening.

a duplicate set of plans drawn up for your permit. This must be obtained from your local building department before you can build.

The slab required seven cubic yards of concrete for the foundation and the footing which was eight inches wide and three feet deep. The slab itself was about four inches thick. Total cost was $121.60 for the transit-mix concrete.

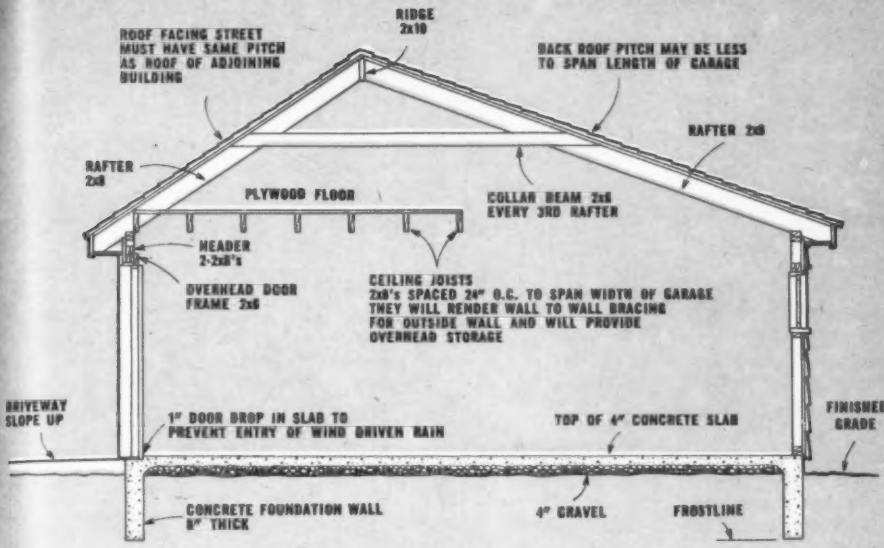
It's important that the slab site be properly prepared before the truck dumps the concrete. The ground should be level and firm. It's also a good idea to put four inches of gravel above grade to keep the slab dry and protect it from frost. Stake out the corners and run a line between the stakes. Form boards



PLAN OF GARAGE

SQUARE is used to obtain correct angle to match roof pitch of the existing dwelling.

RIDGE POLE—2x10—is nailed into place. It should remain true as the rafters go up.



LONGITUDINAL SECTION THRU GARAGE

are then installed. You can use 1x6s or 2x8s, driving in stakes to keep them in place. Make certain that the forms are level. These forms can also be used in the garage when the slab is finished.

You'll need the help of several neighbors to spread the concrete when it arrives. A rake and muscle are the only requisites for the job. As the truck pours the concrete, rake it over the site, level with the forms. Then, using a straight-edged 2x4, and with the help of a friend, work the 2x4 back and forth over the concrete. This is called *screeding* and will give you a fairly smooth surface for troweling. Troweling is done with wooden floats. When troweling, use a piece of plywood or some other flat board to kneel on. Before the cement gets too hard, insert the ⅝x16-inch anchor bolts in the cement. These will be used to secure the garage frame to the sill and sole plates. When the concrete work is done, keep it damp for

PLYWOOD sheathing—⅝ inches thick—is nailed on the walls and roof of building.

FASCIA board is measured for size. The 15-pound asphalt-saturated felt is stapled on.

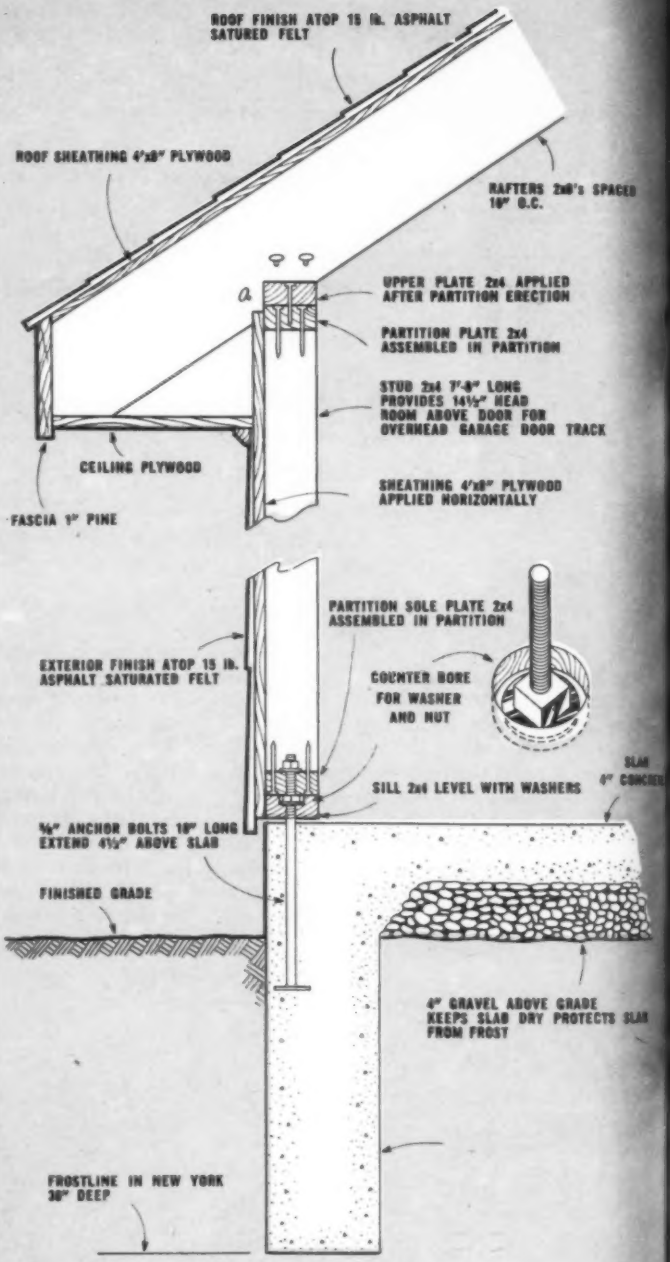
several days so that it will cure properly.

If you don't have a portable power saw, it's a good idea to rent one the day you frame. It will save a great deal of time. Cost is about $8 per day for rental.

A level slab will simplify the framing of the garage. First, snap a chalk line for each wall, making sure the corners are square. Once all the measurements have been checked, drill holes in the sill plate and secure it to the slab with anchor bolts. Use shims to make the sill level, if necessary.

The easiest way to frame is to assemble the wall sections on the ground. Mark, on both the sole and partition plate, the position of each 2x4 stud. Studs should be 16 inches from center to center. Don't forget to frame the windows and doors with double 2x4s on each side as you put together each section.

It is a good idea to use 4x4 corner posts to hold the wall sections. Use ¼x6-inch bolts. A drill is used to make the holes. The bolts can be assembled loosely so that adjustments can be made when the wall goes up. Hammer



TYPICAL GARAGE WALL SECTION

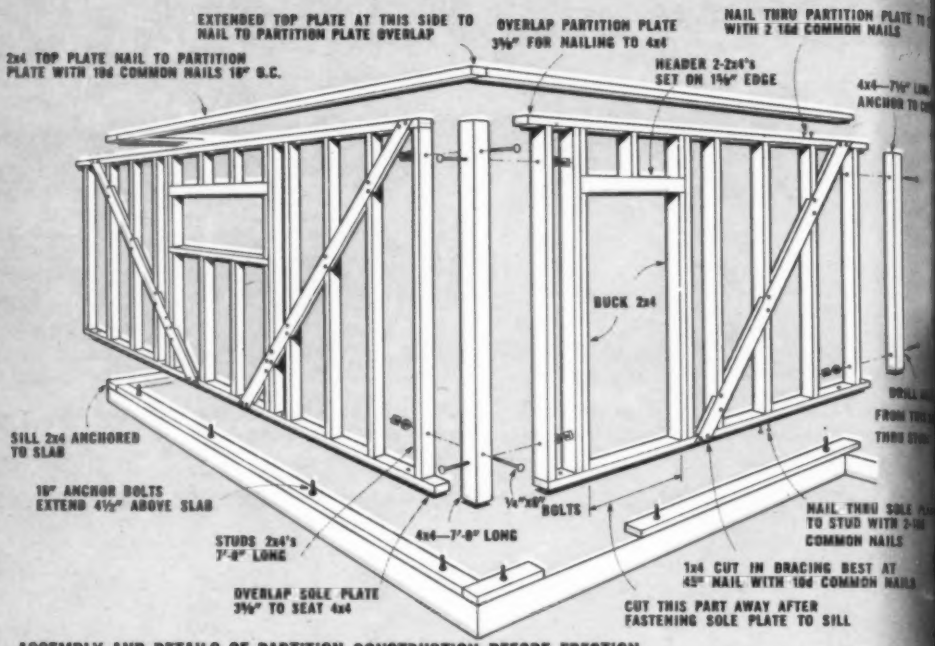
KWIKSET 400 locks are easy to install. A template is used to mark lock's position.

HOLE has been drilled. Kwikset inserted, screws tightened. Lock is ready to work.

KENTILE vinyl asbestos tile was used on vestibule floor. The installation is simple.

SLIDING DOOR allows easy access to garage. Closed, it enhances vestibule entrance.

two four-inch nails through the sole plate and partition plate to secure each stud. As each section is completed, place it on the ground parallel to the sill plate and mark the holes for the anchor bolts. When these holes are drilled the wall sections can be put up and placed on the sill plate. The nuts and washers are now put on the anchor bolts and tightened. Fasten each wall section by the 4x4 corner posts. Insert the bolts and apply the nuts and washers. Once the walls are raised—and you'll need several able-bodied men to assist you—



ASSEMBLY AND DETAILS OF PARTITION CONSTRUCTION BEFORE ERECTION

the top partition plate is nailed home.

Since our garage was attached to the house, it was necessary to construct only one small wall along the back end that joined with the wall side of the house. A 16-foot 2x4 nailed to the house wall provided support for the joists.

Once the front section was up, two 2x8 headers, spiked together, were put up to form the top of the garage door frame. The walls were reinforced with sheathing boards running diagonally across the walls. This operation is actually done while assembling the wall sections. The braces prevent the walls from getting out of plumb.

Next come the joists and the rafters. Joists were run across the width of the garage. They render wall-to-wall bracing and can also be used for overhead storage.

The pitch of the roof should match that of your house. Rafters are cut to size and notched on the ground. A 2x10 was used as the ridge pole and the rafters nailed to it, 16 inches on center. The rafters go flush against the ridge board. Check frequently with your level to make sure that the ridge pole remains true. The rafters should jut out over the lip of the roof according to the amount of overhang you want.

When framing is completed the 4x8-foot plywood sheathing is nailed on the walls and roof. Fifteen-pound asphalt-saturated felt is stapled on and the fascia boards applied. Wall and roof shingles are next. Read the instructions on the asphalt roofing shingle packages before nailing them down.

We chose the 8x7-foot all-steel door made by the Berry Door Corp. of Birmingham, Mich. which our five-year-old son can handle with ease. The door comes with a prime coat of paint and needs only another coat to finish it. Installation is included in the price and takes about an hour to hang.

The front and rear doors to the garage were pre-hung units and needed only to be nailed to the framing. These doors were bought with the rest of the lumber

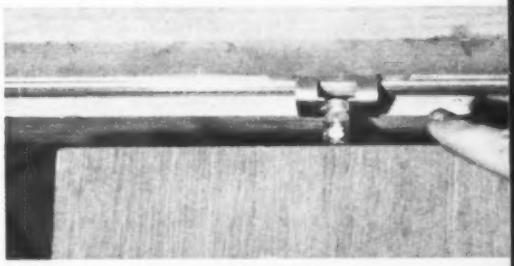
from Dadobuilt Co. of Glen Cove, N. Y. Incidentally, when planning a major improvement for your home, consult with your lumber dealer. He can give you a good estimate of costs and help with the many problems that will crop up.

Kwikset 400 locks were installed in the vestibule doors and the door at the rear of the garage. Kwikset locks are rugged, handsome and can be ordered so that they all operate from the same key. They're also easy to install. If you have to bore the holes for locks and latches, the Kwikset installation kit makes the job a cinch.

When the garage was completed the vestibule was framed. It is 6 feet 10 inches by 4 feet 3 inches and includes a roomy closet with a shelf and a rack to hang [*Continued on page* 152]

ALUMINUM flashing is used where house and garage meet to prevent possible leaks.

LOUVER in garage wall is necessary for ventilation, especially in summer months.



SLIDING DOOR operates smoothly on Grant Pulley and Hardware Corp.'s nylon rollers.

PRE-PRIMED door made by Berry Door Corp. is a lightweight, all-steel, overhead door.

FIXED DOCK is fine for lakes, can be adjusted for seasonal changes in water level. In tidal waters, a float and movable ramp should be added.

BOATS AND BOATING

BUILD YOUR OWN DOCK

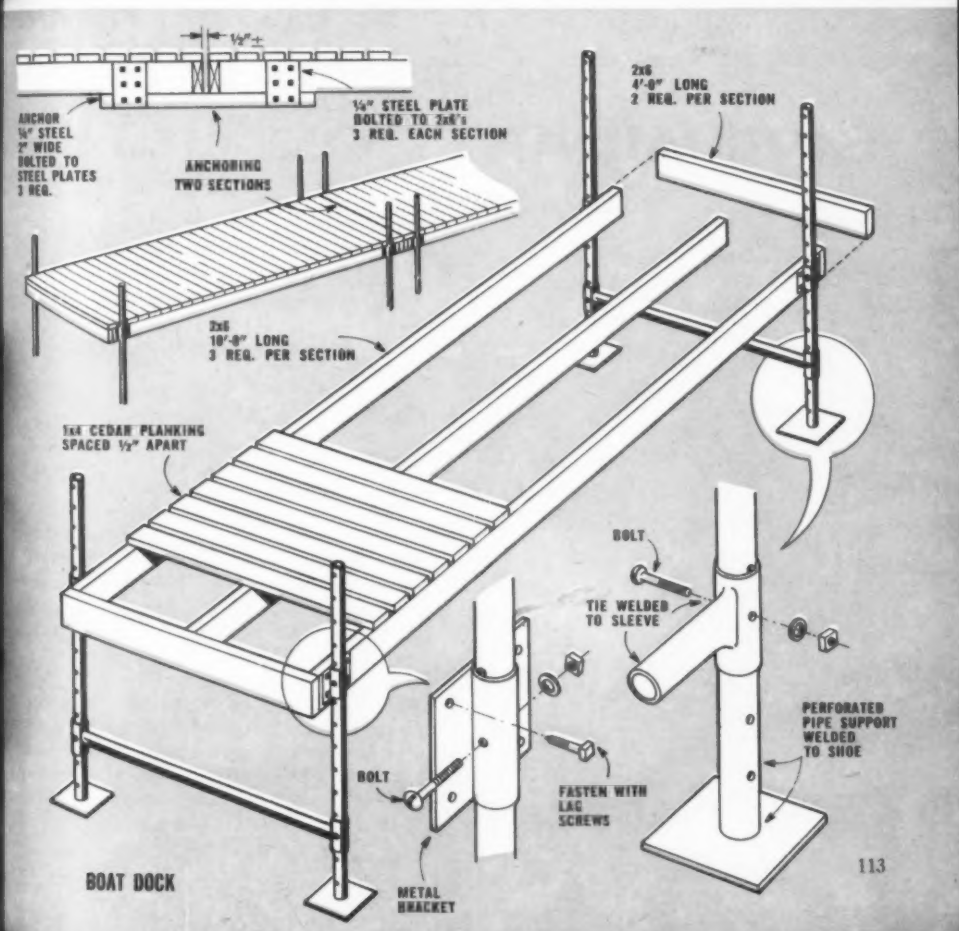
USING special hardware, anyone can build a small dock for as little as $3 a running foot. With saw, hammer, adjustable wrench and a drill to bore pilot holes, a 4x10-foot section can be completed in jig time. Where greater lengths are necessary, the ten-foot sections are easily joined and just as easily separated if the dock has to be taken in during the winter.

Hardware of the type shown is made by the following companies: Sagen Boat Hoist Co., 37-39 Aurelius Ave., Auburn, N. Y.; Central Machine Works Co., 1234 Central Ave., Minneapolis 13, Minn.; and Reimann & Georger, Inc., 1849 Harlem Rd., Buffalo 12, N. Y. Where change in water level is only seasonal, it's simple to adjust the pipe legs in the brackets. In tidal waters, however, a ramp hinged to the dock with bottom rollers resting on a float that can rise and fall is necessary. In either case, it's a good idea to hang padded boards alongside to protect boats. •

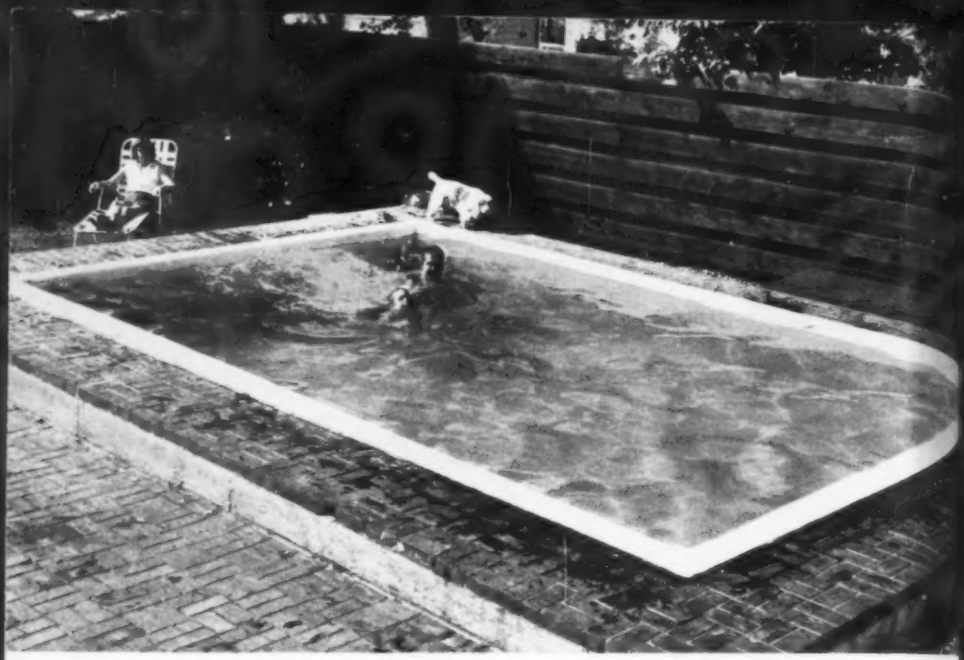
PLANKS are spaced evenly by sandwiching half-inch blocks between them as you nail.

TIE BARS reinforce legs and prevent too much settling if the lake bottom is soft.

DIFFERENT bracket has set-screw which is tightened down on pipe without holes.



BOAT DOCK



SPARKLING CLEAR water due to filter makes swimming in this back yard pool a real joy.

SWIMMING POOL FILTER

LEAF STRAINER placed before the pump is essential to stop debris entering filter.

An economical filter system which gives a pool the luxury touch.

By John R. Doscher

EIGHT years ago, with the help of my wife and children, I built a small, 12x20-foot concrete swimming pool in our back yard. In those days the back-yard pool was nowhere near as popular as it is today. Few people knew anything about construction and maintenance. But we learned through our own experience.

Keeping the water clear and clean was the big chore because we didn't have a filter. However, with measured portions of alum, soda ash, algacide and chlorine, all the dirt can be dropped to the bottom. This can then be removed with a vacuum or siphon system. This

is an awful lot of work and has to be done two or three times a week.

So—we decided to install an underground filter. The estimates given by contractors, which included equipment and the hire of ditch digger, mason, plumber and electrician ranged from $600 to $800. This was enough to convince us that we should try to design and install our own filter unit.

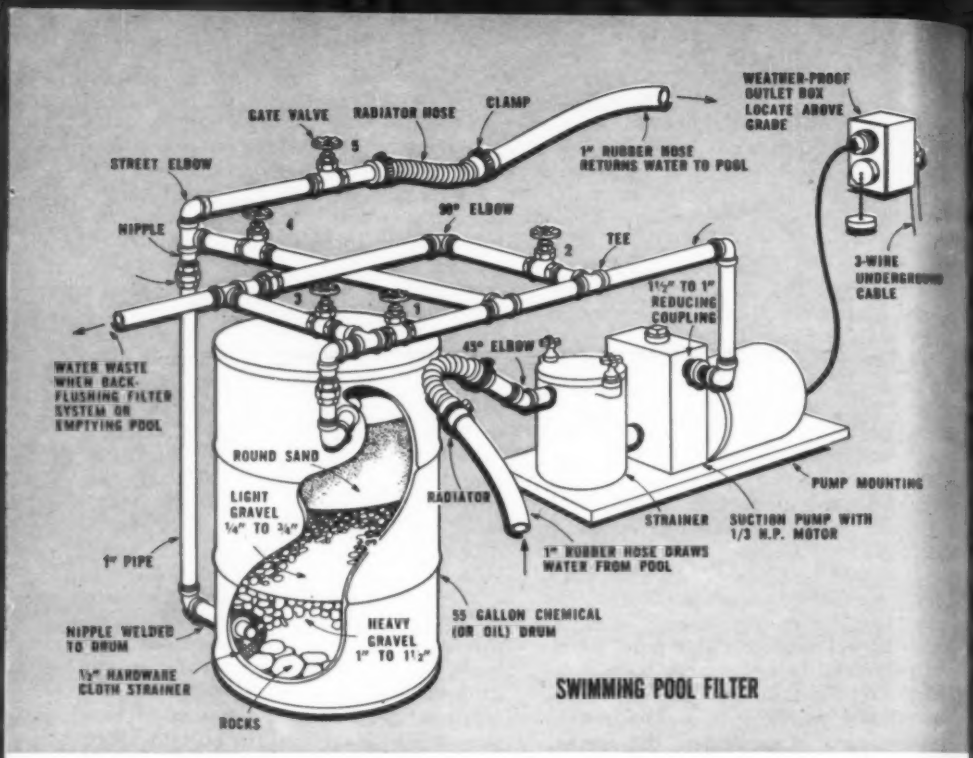
We began with a 55-gallon drum of the common variety used for chemicals or oil, having a removable pressure-seal top. This had to be burned clean. Two 1-inch water pipe nipples were then installed on opposite sides, four inches from the top and bottom. Our major purchase was a waterproof ⅓-hp pump with strainer. The bill of materials also included a 16-foot piece of 1-inch aluminum pipe, three automobile radiator connecting hoses and clamps, lengths of 1-inch galvanized water pipe, joints and valves, 50 feet of rubber hose, sand and gravel for the filter barrel, bricks, cement and sand. An old household vacuum cleaner provided the swivel head for the intake into the filter system.

We decided not to use the drain and in-flow pipe that had been built into the pool when it was first made, as to make use of them would mean extra work and an over-complicated system of pipes. Instead the water was taken into the filter system through the vacuum head and hose and then returned to the pool after filtering through another hose. In this way we can pick up rough dirt through the vacuum head and exhaust it through the bypass system and then switch over to the filter. The water enters through the same head, in both processes. After the eight-hour filter cycle it is an easy matter to vacuum any remaining dirt by merely switching the valves. Thus we needed no plumbing into or out from the pool. This makes this system ideal for round vinyl pools that are installed over ground.

We dug the hole to house the tank and the motor, put six inches of gravel down as a base for water run-off and built double-thick brick walls up to ground level. The motor was mounted on cross pieces of pipe cemented into the walls to keep it off the bottom. Once the tank and motor were in place and the electricity (No. 12 wires with separate ground lead) brought out under-

POWER is brought underground up through copper tubing to waterproof junction box.

HOSE feeds in clear filtered water. When flow becomes weak, system needs backflush.



SWIMMING POOL FILTER

REMAINING DIRT on bottom is vacuumed through head which is also filter intake.

WATER clouded with sediment from filter leaves waste pipe during weekly backflush.

ground from the house, only the plumbing remained.

The plumbing is the real job. Yet if you can put together an Erector set you can certainly handle this plumbing job with an assortment of pre-cut lengths, sleeves, nipples and joints, which can be bought at any Sears Roebuck store. It is useful to remember that the fewer 90° bends in your pipes the better they will function.

This system permits three separate processes to be carried out.

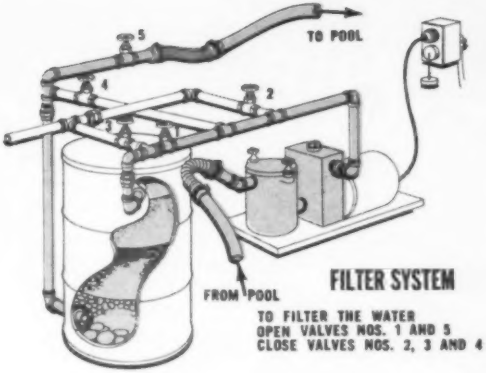
Filter: water enters head, is circulated through filter and returned to the pool.
Backflush: to wash out filter, water from main flows through filter in reverse, taking sediment with it, and is exhausted into waste.
Vacuum: to remove heavy dirt, water enters head and is exhausted into waste, by-passing filter.

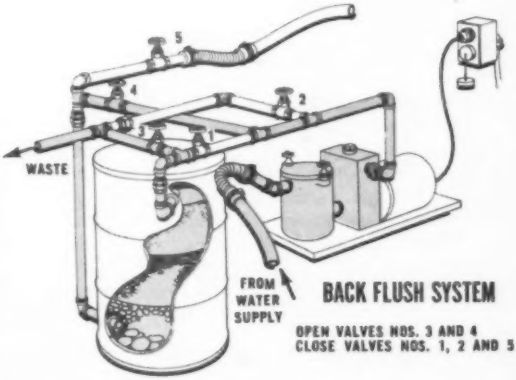
The amounts of rock, gravel and sand are shown on the diagram (left). Be sure you get swimming-pool filter sand with round edges. Sharp-edged river sand will compact like concrete and cause the lid of the tank to blow off in a short time.

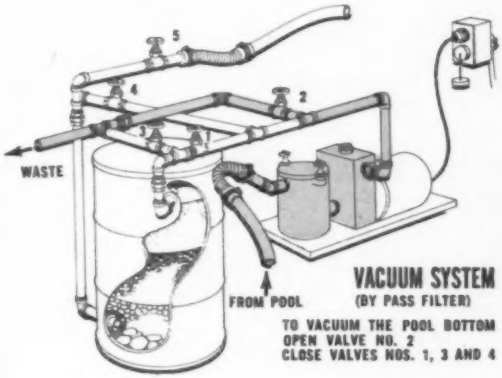
A ⅓-hp motor in this system will pump 1,000 gallons an hour, so the time needed to complete the filter cycle in our 8,000-gallon pool is eight hours. To calculate volume of a pool in gallons multiply length by width by average depth by 7.4. Divide by pumping rate and you will know how long the filter cycle takes.

Despite the filter the water still needs chemicals added each week. A cupful of chlorine should be sufficient for purification, a cupful of algacide to combat algae. To keep the proper pH factor (neither acid nor alkaline) one coffee can of alum and an equal amount of soda ash should also be added weekly.

That's all there is to it. The total cost was around $170, of which $80 was spent on the pump, the rest on the other materials. A really worthwhile investment which is appreciated every time you dive into that fresh, inviting and wonderfully clear water. •







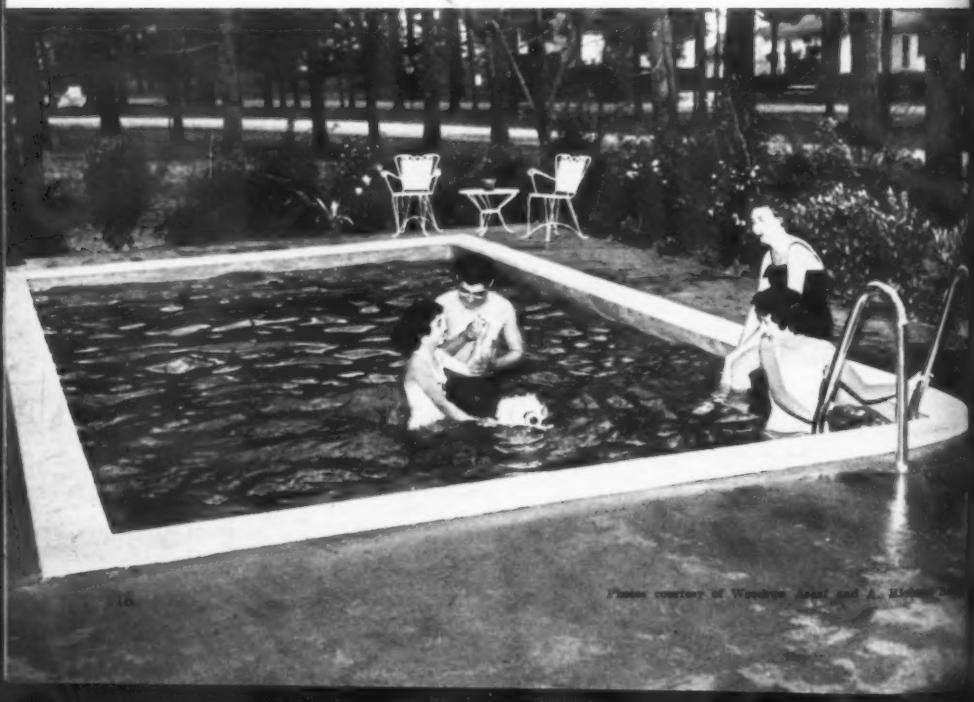
A SWIMMING POOL FOR LESS THAN

$800

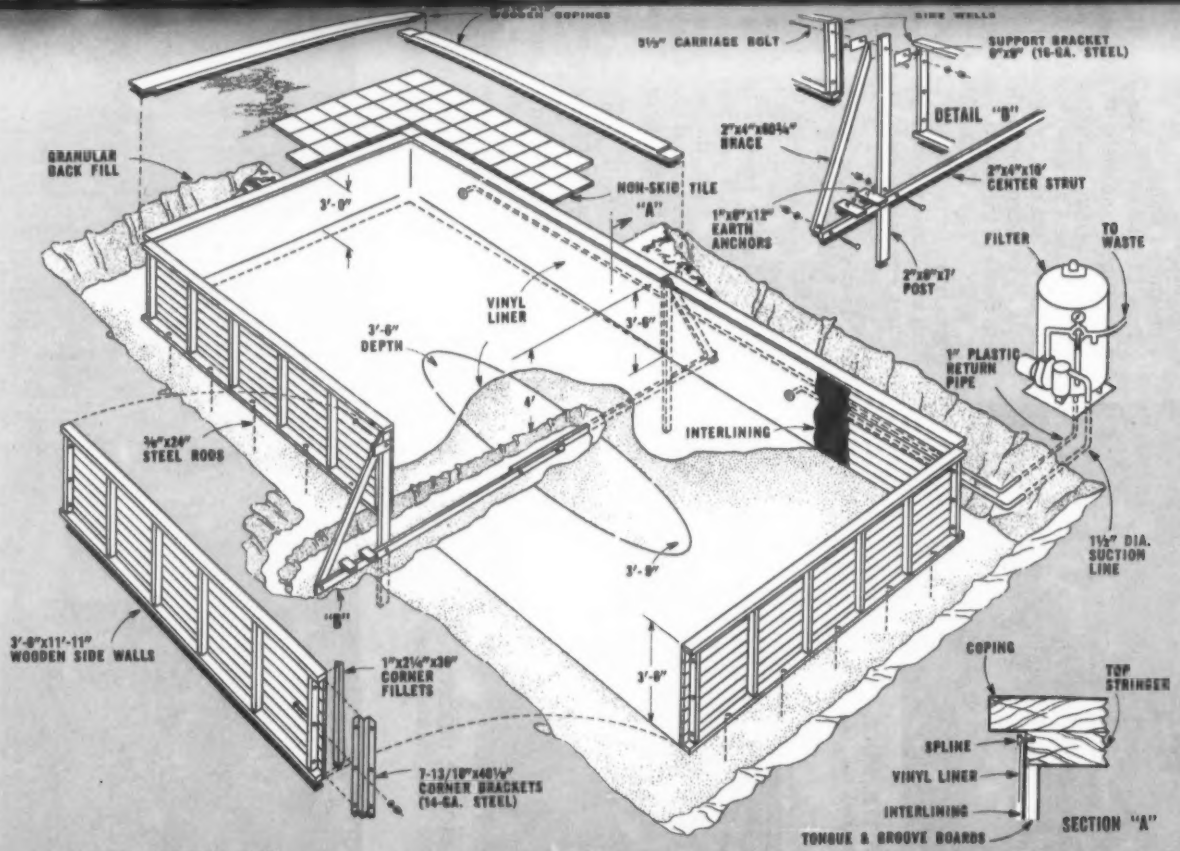
A 12x24-foot, in-the-ground, filter-equipped pool whose plastic liner makes easier building, better swimming.

IT is interesting to reflect how many articles which are part of our daily life were, not so long ago, considered only within reach of the privileged few. The automobile, a vacation abroad, out-of-season fruit, and air travel, a few decades ago belonged to the life of people whom we only read about. Now they are within reach and even taken for granted by people of average means. They have become generally available through developments in technology and production. Among the most recent luxury items to take part in this revolution is the swimming pool.

There has been a downward spiral in the price of pools as new methods and materials for construction have been evolved. The latest and most effective price-reducing material is the plastic liner. This is a giant, one-piece, heavy-gauge covering which makes any supporting structure water-tight. This means that non-watertight materials such as concrete block or wood can be used in construction. They hold the



Photos courtesy of Woodrow Assaf and A. Richard B...



12'x24' UNITIZED POOL

AFTER MUCH THOUGHT site has been staked out and digger begins excavation.

MACHINE DIGGING, a matter of hours in this soft, rockless soil, is hand-finished.

liner and the liner holds the water. T liner also reduces the labor and cost maintenance as no painting or scra bing is necessary. Dirt and algae a easily brushed from the smooth, col impregnated finish.

Two 12x24-foot, in-the-ground po of this type, complete with filter syste are now being marketed for un $1,000 by the Cascade Pool Co. of Ed son, N. J., makers of Buster Cra Pools. The Eden Roc model, with a u form depth of three-and-a-half feet, m for $795. The Fontainbleau at $ slopes from three-and-a-half to five fe With a unitized wooden framework a a one-piece plastic liner guaranteed ten years, each pool is designed w the do-it-yourselfer in mind with gard to both price and construction.

The first thing to think about in bui ing a pool is where and how you going to dig the hole. There is no g ting around it. If you want an in-t ground pool with the advantages being able to sit around it and the be fits it gives to the landscape, a hole m be dug.

To dig it yourself, removing an e mated 22,000 shovelfuls, you need p tience, strength or a large family helpers. The most popular alternat is to hire a mechanical digger or b hoe. If conditions are good the ex vation can be done in less than a d for under $100. Before the diggi starts, however, an intensive skull s

UNITIZED FRAMEWORK consists of six prefabricated wood panels each 12x3½ feet.

WHEN end is completed a lining of sand on bottom and fabric at sides follows.

sion is called for. The more thoroughly you think things out, the less the hired machinery will cost.

After checking local building codes and zoning restrictions, go ahead and select the site, carefully taking several factors into account. The ideal location is an open, sunny spot away from trees. In estimating the size of the pool area allow at least six feet, preferably more, on one side at least, as a play area. Remember that space will also be needed for the machine to work in, if you are hiring a back hoe. You will also need to dispose of the excavated earth which is not used as back fill.

The more level the site the easier the excavation will be. On a steep slope, back cutting at the high end and filling at the low will add expense. A hollow which is liable to seepage from the surrounding area will not be satisfactory as water will tend to gather round the outside of the pool's framework. The site should be planned to avoid septic tanks, sewer pipes, and underground wiring.

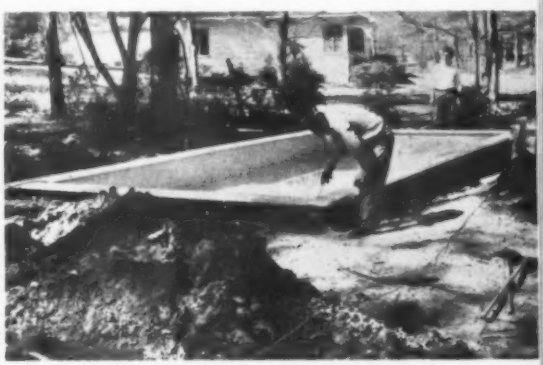
The filter's location should be decided at this stage. It should not be more than 18 feet from the deep end or 50 feet from the shallow end with the pump's height kept at a minimum.

Assembly of the unitized framework and the installation of the liner are clearly explained in step-by-step instructions issued by the manufacturer. The frame can be a one-man job but to put in the liner you will need several pairs of hands. There is a point—as when laying a large carpet—at which it must be pulled in several directions at once to remove the wrinkles. Water is run in while the liner is being fitted, its weight and pressure helping to seat the liner. As the water rises, the gap between the framework and the surrounding ground must be filled in with soil.

When the pool is full the coping is attached and the surrounding area graded so that surface rainwater will drain away from the pool. The filter system should now be installed. A non-skid walk of concrete or flagstones, if added, will help to prevent accidents and a fence around the site will discourage trespassers and keep away animals and small children.

With your own pool a few steps away the home takes on a different aspect. The pool will be a central feature when entertaining on summer evenings, the barbecue's natural complement. For children it provides a form of recreation which never loses its appeal and enables them to become confident swimmers at an early age. The whole family will swim more, bringing increased opportunity for shared enjoyment. In addition to the pleasure and convenience of being able to begin and end each day with a refreshing dip, there are the unexpected benefits to your health that this most relaxing form of exercise will bring you.—*Adam Nott*

STAPLING fixes liner's position reached after careful fitting needing many hands.



LINER INSTALLED, grading of surrounding area will blend pool into the landscape.

Wind Speed Indicator

Spinning in a fresh breeze, the anemometer shows wind speed on a meter inside house.

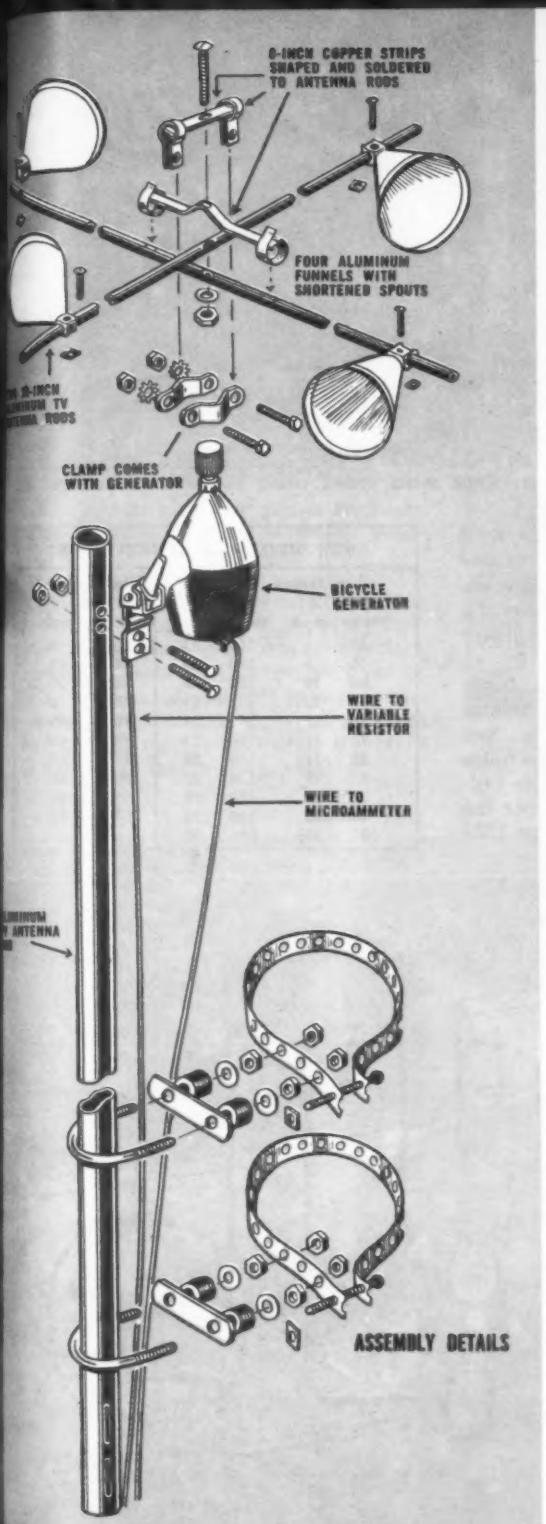
Amateur meteorologists will go for this—a roof-top anemometer to measure wind velocity.

By Axel Campbell

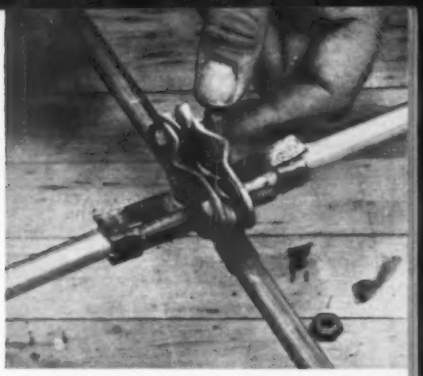
IF the phenomena of weather fascinate you, then you will find this intriguing wind-measuring device well worth the brief time and little money required to build it. Called an anemometer (from the Greek word *anemos*, meaning wind), the mechanism is basically a wind-driven generator with a meter that records the amount of current produced. With the aid of a chart, this current reading is then translated into wind velocity in terms of miles per hour.

The materials needed to construct this project include: (1) aluminum tubing from a scrapped television antenna (for the main pole of the anemometer and for the two rotating crosspieces that support the four wind cups): (2) an ordinary bicycle light generator; (3) a milliammeter or microammeter; (4) a low-voltage silicon diode rectifier (which connects to the negative terminal of the meter and changes the generator output from AC to DC); (5) four six-inch-diameter funnels; (6) a variable "linear" potentiometer (volume control); (7) a three-way lamp switch; and (8) a rigid, covered plastic refrigerator container to house the meter and switches.

Begin by bolting the bicycle generator to the 36-inch-long pole of the unit as shown in the drawing. Cut the remaining antenna tubing into two 20-inch lengths and drill a screw hole through the center of each. Snip two pieces of copper—one eight-inch strip and another equal to the length of the clamp provided with the generator—and drill a hole through the center of each. Now place a long bolt through the holes of these strips *and* through the two aluminum crosspieces and secure the



ASSEMBLY DETAILS



GENERATOR clamp attaches to underside of two crosspieces.

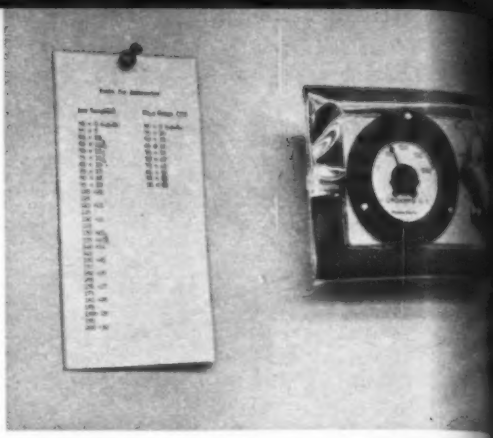
BOLT generator to main pole and tighten clamp to the rotor.

assembly with a nut and lock washer.

Bend the eight-inch piece of copper around the top crosspiece to form a clamp, then stabilize the lower crosspiece with copper rings wrapped around that section of tubing and soldered to the clamp.

Now slip the wind cups over the ends of the crosspieces. Leave a short section of spout on each funnel through which a hole the diameter of the tubing can be

MICROAMMETER is fitted into hole cut in lid of refrigerator container.



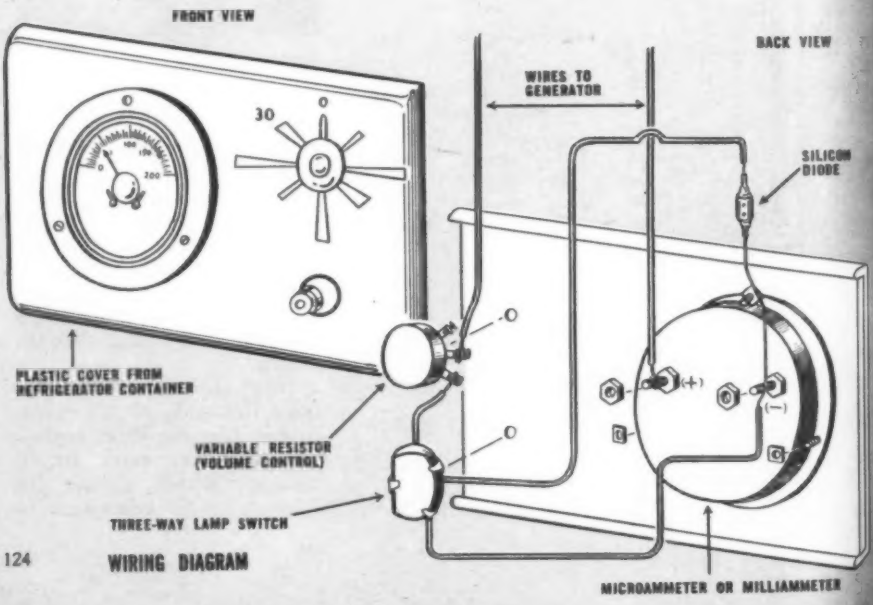
READINGS on microammeter are quickly translated into wind speed using conversion chart at left.

drilled. With the funnels in place, drill small holes through both the spouts and the tubing for the connecting screws, then attach the crosspieces to the generator shaft using the generator clamp.

Next, remove the lid from the plastic refrigerator container and cut a hole in it to take the meter which is then screwed into place. Now drill the holes for the three-way switch and the volume control and install these as per the drawing. [*Continued on page* 152]

ANEMOMETER CONVERSION CHART

Low Range (0-30 mph)				High Range (30 mph up)	
meter	mph	meter	mph	meter	mph
50	0	110	21	50	0
55	5	120	22	55	10
60	10	130	23	60	30
65	12½	135	23½	65	32
70	15	140	24	70	35
75	15¾	150	25	73	40
80	16	160	26	75	45
85	17	170	27	80	50
90	18	180	28	85	55
95	19	190	29	90	60
100	20	200	30		



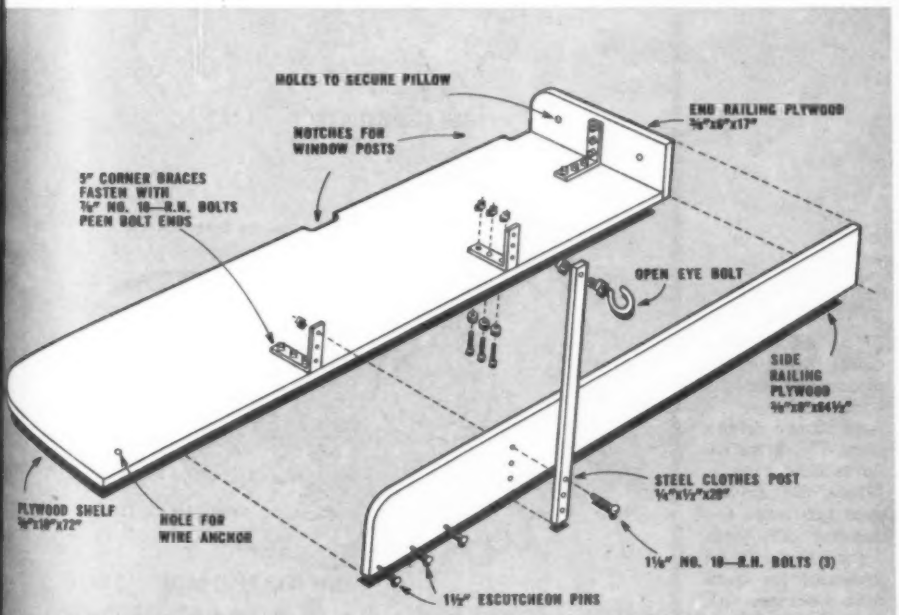
WIRING DIAGRAM

STATION WAGON TRAY

TRAY is just slid into place. Pads are taped to window ledges to protect paint.

LUGGAGE fits neatly into the driver's blind spot. Suit hangs from the upright.

LUGGAGE storage woe in a station wagon ends with a plywood tray which is notched to fit around the door posts and rests on the two seat backs. Wire anchored to the tail gate prevents the tray from sliding forward on stops and a foam rubber pillow on the front end protects the driver's head. •



STATION WAGON TRAY

Design by Douglas Fir Plywood Association

CAR CARE

REAR AXLE RATIOS

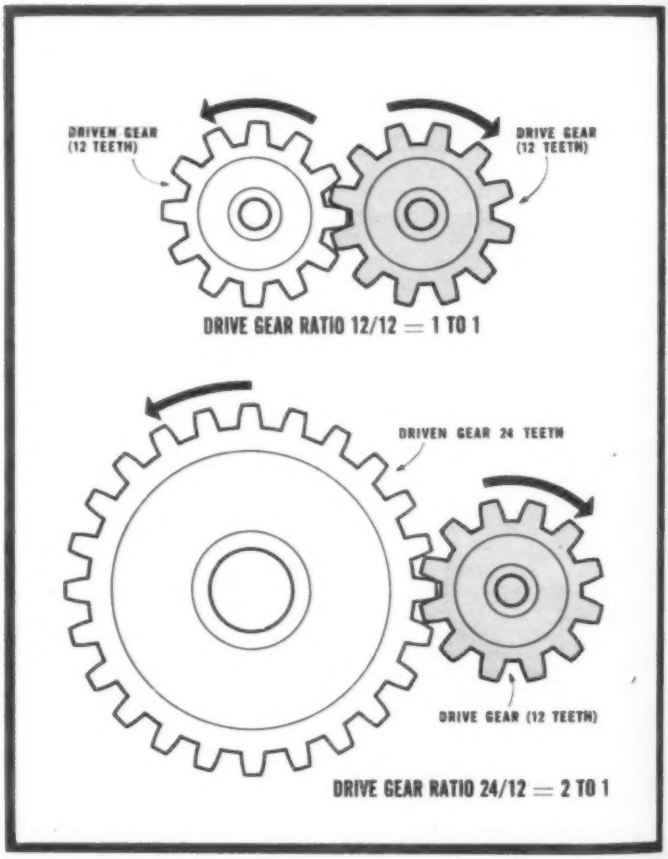
Do you know how to calculate the rear axle ratio of an automobile? What is the best ratio for your car?

MOST motorists lift the hood and concentrate on engine power when thinking about performance, but those who know their stuff do much of their checking at the other end of the car. Their concern is with the rear axle ratio in its relation to total gear ratio. Down-gearing is what gives the engine that important item—mechanical advantage.

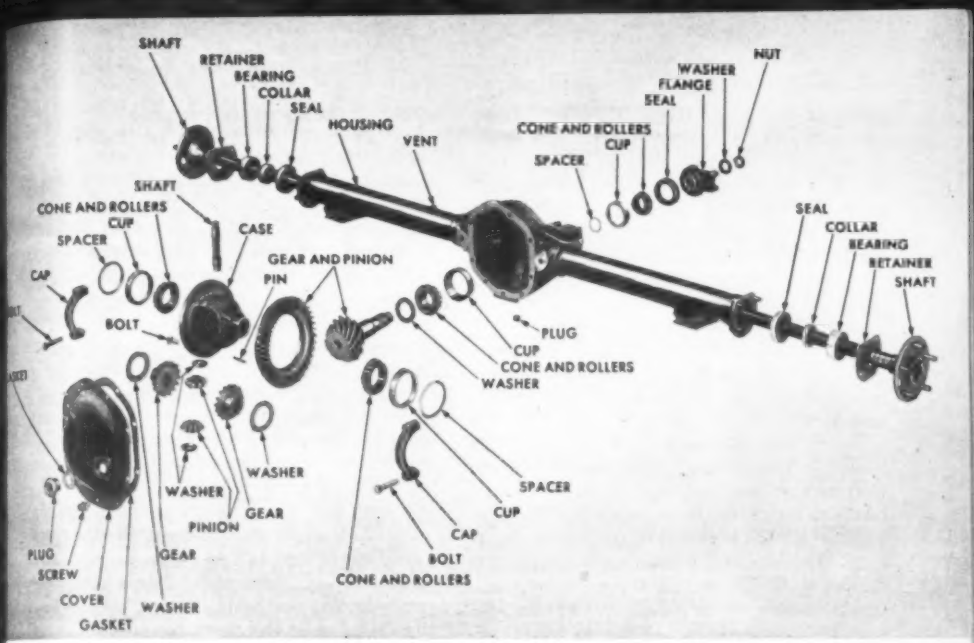
Because this ratio business has so much to do with gas

By Frederick C. Russell

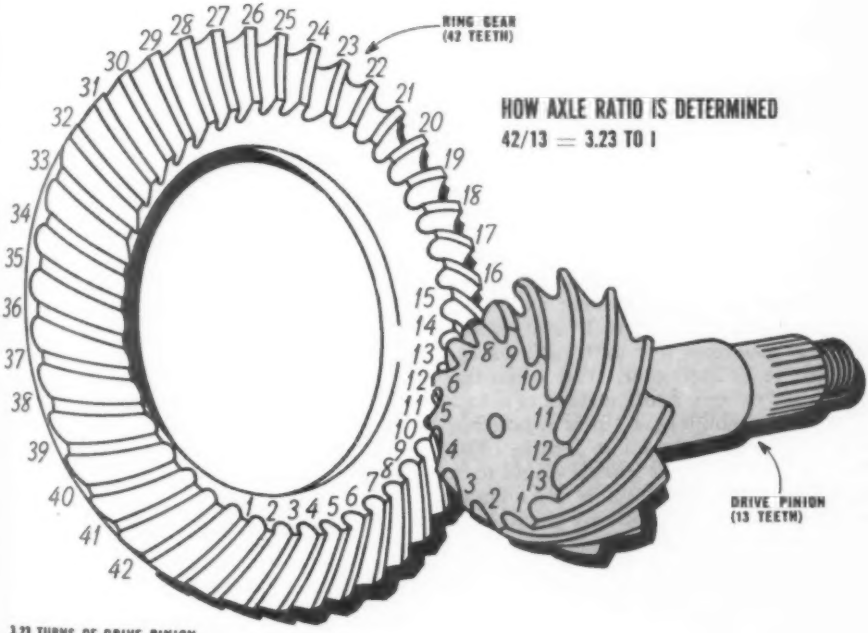
Member, Society of Automotive Engineers



THE MAGENTA colored gear at top of drawing has the same number of teeth as the driven gear. The drive ratio is now 1 to 1. When the driven gear has twice the number of teeth (lower part of drawing) the gear ratio becomes 2:1.



EXPLODED view of a Dodge rear axle. Ring and pinion gears, left center, determine axle ratio.



THE COLORED drive pinion gear has 13 teeth. This number, divided into the number of teeth in the ring gear (42 teeth) gives us a rear axle ratio of 3.23 to 1.

mileage it is a lot more important than the number of horses under the hood or the way they are fed by the carburetor. You can switch a 3 to 1 rear axle ratio to 4 to 1 and, without even bothering to soup up the power plant, transform an old gig into something that will surprise even a motorcycle cop. *But this will be only in the low and medium speed ranges.* Top speed would be cut down because the engine would need to hit higher rpm's, and it would not be in condition to do this. Gas mileage would also show a drop.

Don't get the idea that the trick in boosting gas mileage lies in less reduction at the rear because a lot of things have to be carefully considered. If the engine doesn't receive sufficient help from the rear end's reduction gears, the driver will find himself forced to shift down much more often. The engine won't have enough power to take the car around corners without bucking or pinging while in High. Since downshifting under such conditions calls for use of a transmission gear which is actually too low for the engine's needs, there is further waste. A full torque converter, instead of mechanical or automatic gears, would handle this job better because it provides a variety of "ratios" and has just the right one for the occasion.

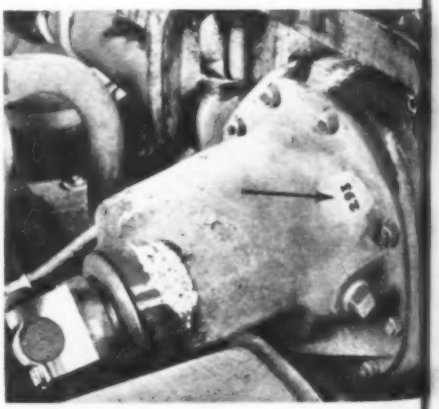
Before we uncork some of the interesting and important facts about ratios let's first decide what we mean by low and high ratios. Technically a ratio is considered *high* if the number is mathematically high; *low* if low. That results in confusion because we are all familiar with standard transmissions and have always thought of a 4 to 1 ratio as low or first gear and a 1 to 1 ratio as direct drive or high gear. But when the *rear axle ratio* is 3 to 1 instead of 4 to 1 it is nearer a high gear. It is impossible for an axle to have a 1 to 1 ratio. For in such a car the rear wheels would turn once for every revolution of the engine!

The standard gearbox may have a 4 to 1 or even higher reduction for Low gear. This is technically a high numerical reduction but the result is very low gearing. In High the transmission is 1 to 1 between the engine's crankshaft and the propeller shaft. That is no reduction at all but is generally regarded as a *high* gearing.

Just to simplify things we can also write the ratio as a lone number and omit the "one" part. Instead of writing 2.55 to 1 we will just put this down as 2.55. With this cleared away we are ready to face the fact that the transmission's reduction ratios must be known when considering the over-all picture. Make a note that the total gear ratio of any car is the transmission gear ratio *plus* the rear axle ratio. There may also be the added effective reduction of switching to smaller wheels or even underinflated tires. This does not actually change the rear axle ratio because the propeller shaft will still rotate the same number of times for each turn of the rear wheels. But the wheels will turn more times per mile if a smaller wheel size is used or the tires are soggy.

You have doubtless noticed a slight power loss when using snow tires because their thick treads make the actual tire circumference greater. You lose some "feel" of engine pep just as you gain more such "feel" with smaller wheels. Underinflation is not the way to get more effective power from the engine because the greater drag of the soft tires offsets any gain.

In the selection of rear axle ratios the car makers are forced to compromise.



HOW DODGE identifies rear axle ratios. Ford uses brass tag under one of bolts.

A motorist should order his car with the ratio best suited to the terrain over which he will drive.

A car with greater gearing down (4 to 1) would not be economical in flat country. The engine would have to turn over faster and would sound noisier at speed. Oil would burn off faster. His top speed would be reduced. The fellow with a lower rear axle (3 to 1) ratio would not be too happy with the way his car climbed hills. He would have to use lower gears more often. There would be less effective compression-braking on downgrades.

Compromising is more easily accomplished when the car is equipped with a 3-speed automatic gearbox rather than a 2-speed box and still easier in the case of a 4-speed automatic. The Dodge Lancer, for instance, with either the 101 or the 141-hp engine has only two standard ratios—the 3.55 for the manual transmission and the 3.23 for the automatic. This gives good all-round economy and liveliness.

The axle ratio is usually stamped on a tag attached to the housing or stamped on some part of the assembly. But lacking this guide you can find the ratio by counting the number of teeth on the pinion and the ring gears. Then divide the number of teeth on the ring gear (driven gear) by the number on the pinion gear (drive gear). Here's a quick way to get a rough idea of the ratio of your car in the event that you suspect you have purchased a car intended for use in another area of the country. With the car on a lift, note the number of times the propeller shaft turns for a single rotation of one of the rear wheels. Make allowances for backlash.

Keep in mind that the *type* of gearing used for the pinion and ring gears does not determine the ratio. The early rear-end gears were of the spur bevel type. Then came the spiral bevel gearing. Today's cars use hypoid gears. The pinion meshes with the ring gear below the latter's center line. There is a sort of wiping action between the teeth as they mesh and unmesh. *The ratio is always based upon the difference in the number* [*Continued on page* 145]

SERVICE TIPS

from Detroit

Under certain conditions, an oily film can form on the inside of the glass in late-model Chevrolets. It's caused by volatilization and subsequent condensation of solvents or plasticizing agents used in synthetic interior materials and finishes. Remove it with a vinegar-soaked rag followed by a rub with a dry cloth.

* * *

Noise similar to knock caused by a loose main bearing may occur at 50 to 65 mph on light acceleration of some '60 and '61 six-cylinder Plymouths. The cause can be exhaust pipe contact with the frame box section or the steering gear chuck-to-frame retaining bolts. An ⅛-inch shim between the right motor mount and the frame bracket will correct it.

* * *

The rear axle drain plug has been removed from late-production '61 Chrysler and Imperial models. Instead of draining the rear axle lubricant, it is removed through the fill hole by means of a suction pump fitted with a curved tube nozzle or hose of small diameter.

* * *

Power steering pumps on '61 Dodge models are often thought to leak when they don't. Usual causes for overflow of the fluid are: overfilling and normal expansion after warm-up; steering the car without the engine running when being towed or pushed; or operating with a loose pump drive belt or too low an engine idle speed.

* * *

The alternator belt torque tightening specifications on '61 Plymouth and De Soto Cars equipped with air conditioning and 361 or 383 cu. in. engines has been revised to 60 ft. lbs. for new belts and 40 ft. lbs. for used belts. A belt is considered used after half-hour operation.

GENTLE JAWS of hardwood-faced plywood convert machinist's vise for woodworking. Cord keeps pair together when not in use.

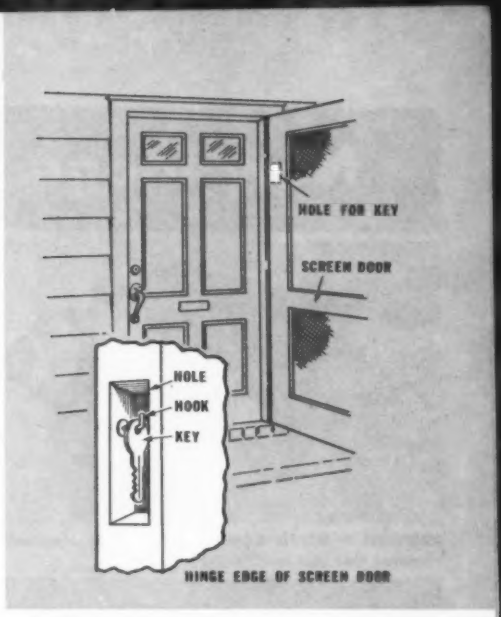
WORN DOORKNOB SETSCREW that regularly works loose will hold fast if threads are slightly distorted by tapping with hammer.

HOME AND SHOP

Send Freddie Fumbles your idea of a good short-cut, time-saver or safety device in your work, whether it be in the home, shop, office or farm. Each tip accepted will be paid for at the rate of $10. Naturally we cannot acknowledge or return the ones we cannot use. However all will be carefully read and evaluated. (Those which we can use in other departments of MI will be paid for at our regular rates.) Please send in your ideas on a postcard only. Address to Freddie Fumbles, *Mechanix Illustrated*, 67 W. 44th St., New York 36, N. Y.

FREDDIE FUMBLES

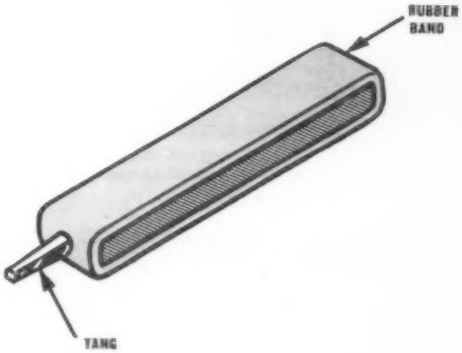
ALCOHOL LAMP for shop use is made from old oil can and fibrous string. Cut off spout leaving about an inch as shown.



FRONT DOOR KEY can be hung from screw-hook in a hard-to-see but easy-to-reach niche chiseled at inside edge of screen.

SHORTS

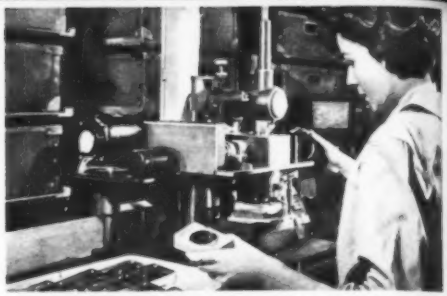
TO PROTECT FILES cut a band of the required width from old inner tube, punch hole one end for file's tang and you have a tight fitting cover to shield surface in tool-filled drawer.



THANKS: MRS. EMMETT GARDNER SAN ANGELO TEXAS

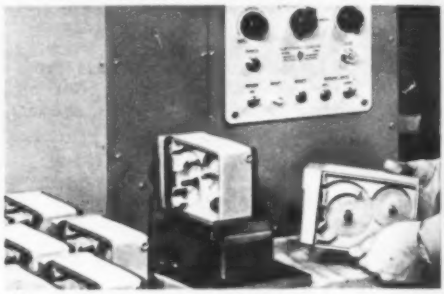
New Ideas in Photography

BROWNIE 8 MOVIE CAMERA, f/2.7, outperformed cameras that cost much more.



ELECTRONIC CONTROL is used to "zero" lens into exact setting for clearest, sharpest movies.

SINGLE-UNIT precision body assures dependable performance—costs more per ounce than metal.



ELECTRONIC FRAME-COUNTER checks film travel—assures movies that move at correct speed.

Kodak creates low-cost movie camera that outperforms its price

Quality 8mm movies—from a camera that costs less than $27? Sounds impossible—but it's a fact!

In side-by-side tests, Kodak's Brownie 8 Movie Camera, *f*/2.7, outperformed movie cameras that cost much more. Movies were sharper, clearer, steadier.

The secret? Modern materials, modern skills.

First, Kodak engineers created a new camera mechanism—with fewer moving parts—that does a better job than older, complex mechanisms. Rugged, too; less likely to get out of adjustment.

Next, they selected a wide array of modern man-made materials, each to do a superior job. The Brownie 8 Movie Camera actually has 27 non-metallic parts. They cost more than metal, ounce for ounce, but they permit precision fabrication without the penalty of high assembly cost.

And finally, the engineers devised a mechanized assembly system, with electronic setups that maintain precise inspection and high performance standards.

Examine a Brownie 8 Movie Camera. It will give you up to 40 average-length scenes on each roll of 8mm film. Best of all—for less than $27—it will bring you the thrill of your own top-quality movies!

from Kodak

New automatic cameras solve old problems of summer action

Two Kodak automatic 35mm cameras are bringing new freedom to summertime picture-taking—where action is fast and conditions change quickly.

The Kodak Motormatic 35 Camera and Kodak Retina Automatic III Camera not only set the exposure for you automatically—they also let you select fast shutter speeds to handle fast action. And the Motormatic 35 Camera even advances the film for you—keeps you always ready for the next shot!

Fast action is only one summer problem—when picturing sports or frolicking kids, for example. Variable light is another—as when clouds are passing across the sun. And going from sun into shade is a third.

Fast shutters . . . electric eyes

The Kodak Motormatic 35 and Retina Automatic III Cameras handle all these situations easily. On the Kodak Motormatic 35 Camera, you can set the shutter up to 1/250—on the Kodak Retina Automatic III Camera, all the way to 1/500 second.

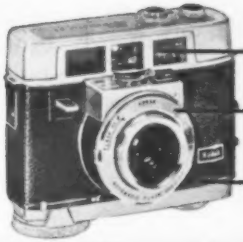
And each camera has an electric eye which reads the light continuously. When you press the shutter release, your lens instantly sets to the right opening.

Manual setting, too

If you wish, you can set either camera manually. The Kodak Retina Automatic III Camera also has a precision lens-coupled rangefinder for measuring distance. And the Kodak Motormatic 35 Camera has a special linkage for flash shots—as you change focus, the lens opening automatically adjusts for correct flash exposure.

Examine these remarkable ultra-modern cameras. One is just right for *your* kind of summer picture-taking.

See your dealer for exact retail prices. Many dealers offer terms as low as 10% down.



KODAK MOTORMATIC 35 CAMERA can take 10 shots in 10 seconds! After each shot, a tiny spring motor swiftly advances the film, cocks the shutter. Fast f/2.8 lens. Fully automatic lens setting. Full manual control. With this camera, you can keep your eye glued on the action, ready for the best shots, no matter how fast they come. For flash pictures 5 to 25 feet from subject, setting focus automatically sets correct lens opening. Less than $110.

KODAK RETINA AUTOMATIC III CAMERA has superb Retina Xenar f/2.8 Lens. Fully automatic exposure setting, with override for manual control. Fast single-stroke film wind. Coupled rangefinder. Depth-of-field scale. ASA film settings from 10 to 1250. Shutter release locks if light is too dim or too bright. Less than $130.

Now—snap fast action in color!

This weekend, start exploring the new picture possibilities opened by Kodak's ultra-fast 35mm color film, *Kodak High Speed Ektachrome*. With a sizzling daylight index of 160, it lets you take action shots in color that once were out of the question. Lets you get greater depth of field. Permits many indoor available-light shots with the camera *handheld*. Try it!

Prices subject to change without notice.

EASTMAN KODAK COMPANY, Rochester 4, N.Y.

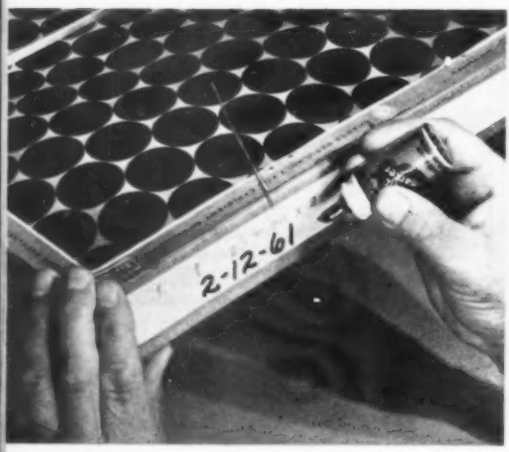
Kodak TRADEMARK

See Kodak's "The Ed Sullivan Show" and "The Adventures of Ozzie and Harriet"

TRY THESE TIPS

TO TRIM board end without saw skip or chipping, back it up with scrap as shown.

TINY screw driver is nail with the end filed flat and top bent over for leverage.



DATING new furnace air filter helps establish the interval for a regular change.

LOOSE chair rung is repaired by slitting end, inserting wedge, then gluing in place.

Now for Schick Injector Users, an edge so smooth you won't believe there's a blade in the razor!

ANNOUNCING A NEW DIMENSION IN SHAVING COMFORT—THE NEW SCHICK INJECTOR BLADE WITH KRONA EDGE!

METAL MAGIC!

Radical new blade assures clean, close shaves with almost incredible ease and comfort. So smooth, your first impression is—*your razor has no blade at all!*

The only way to appreciate Krona Edge is to try it. The Krona Edge is designed expressly to fit the Schick Injector Razor—don't accept imitations. Krona Edge comes in 2 injector sizes, 10 blades for 69¢ and 15 blades for 98¢.

Now a frank word of explanation!

Production of Krona Edge is extremely complex. With the tremendous demand for this sensational new injector blade, it's just possible *your* store may run out. If this is the case, we're so anxious for you to experience the comfort of a Krona Edge shave, we'll send you a

FREE TRIAL SUPPLY!

Just send us your name and address and we'll mail you a 4-blade injector with our compliments.

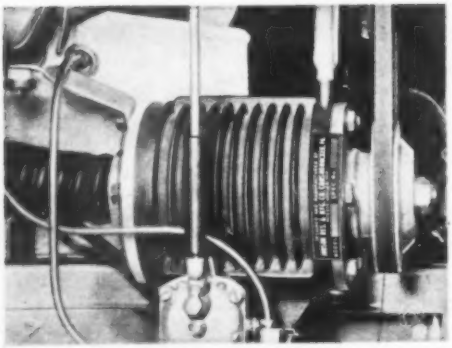
SCHICK SAFETY RAZOR CO.
Box 212, Milford, Connecticut

NEW
KRONA
EDGE

SCHICK QUALITY AROUND THE WORLD
Factories in Halmstad, Sweden; Toronto, Canada; and the U.S.A.

Test your automotive I.Q!

QUICK QUIZ BY QUAKER STATE



1. *What is the function of this piece of equipment?*

2. *What is the significance of this symbol?*

The symbol stands for the complete engine protection you get with Quaker State, the motor oil that's super-refined from 100% pure Pennsylvania Grade Crude Oil. It keeps your car on the road, and out of the repair shop—saves you money. Ask for Quaker State by name—available most everywhere. For your dealer's name, call Western Union Operator 25.

ANSWERS: 1. *Supercharger, to give extra power.*
2. *World's finest motor oil.*

QUAKER STATE OIL REFINING CORP., OIL CITY, PA.

Sailboat Trailer

[*Continued from page* 102]

the axle. The retaining plates can then be made.

One spring with the rear shackle in place is now attached to the axle by means of the U bolts and the retaining plate—and with the saddle merely clamped in place. The next job is to establish the length of the front spring attachment bracket to obtain a five-inch clearance between the top of the axle and the bottom of the frame. Use a 2x4 to substitute for the frame, resting it on the rear shackle bracket and on the spring's front eye. Pack pieces of wood between the front eye and the 2x4 until the five-inch dimension is obtained. Then measure the distance from the center of the eye to the bottom of the 2x4 to get the dimension A on the front bracket. If the end plates are tilted more than two or three degrees from the vertical when the 2x4 is horizontal, slack off the U bolts and reposition the saddle. Then tighten up the U bolts and mark the axle so that the saddles can be welded in position. The front spring brackets may then be made.

The frame is made from 16-gauge mild steel rectangular "tubing" as shown in the drawing. Since thin-gauge tubing is inclined to warp badly when heat is applied, it's a job best left to the professional. The front post is high enough to allow carrying the mast over the trunk of a car but you'll have to make it higher or carry the mast on the roof if you have a station wagon.

The cradle is best made by first lifting the boat onto the frame and then taking measurements from the frame to the bottom of the boat. The cradle shown was padded with ¾-inch-thick felt and covered with canvas attached with metal screws. An easier way is to fasten ¾x1½-inch wood strips to the cradle and cover it with canvas tacked to the sides of the wood.

The position of the bracket for attaching the stem fitting of the boat to the front post of the trailer is found with the boat on the padded cradle. This is also a good time to find the positions for the spring attachment brackets to insure that the trailer will be balanced correctly when the axle is fitted. A down load of 25 pounds is about

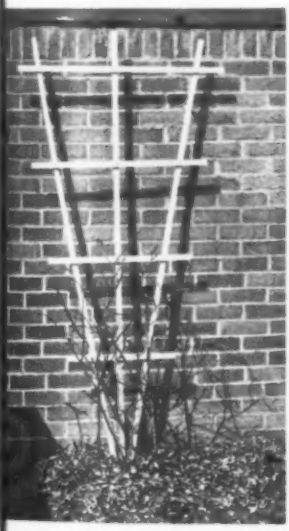
[*Continued on page* 138]

NEW GARDEN PRODUCTS

WRITE to the H. K. Porter Co., Philadelphia 35, for a copy of their free Pruning Guide. . . An adapter to make a garden shower from last year's hula hoops is made by the Special Products Corp., of 1120 North Main St., Elkhart, Ind. . . . Name stakes for marking plants and shrubs are made by the Harlane Co., 1157 Glencoe Ave., Highland Park, Ill. . . For a soluble lawn fertilizer write to the FX Lab Co., 77 Okner Parkway, Livingston, N. J. . . How To Plan Modern Home Grounds ($5) is the name of a worthwhile book on this topic published by Sheridan House, Inc., 257 Fourth Ave., N. Y. C. •

BRASS shut-off valve can be "spliced" into garden hose; saves walking back to bib; $1.75.
The Drumcliff Company, Towson 4, Md.

LOW BORDER fence resists rusting. It is made of heavy steel wire covered with white plastic.
Arlen Industries, Inc., 444-12th St., Brooklyn 15, N. Y.



SIX-FOOT aluminum trellis never needs painting. Type shown sells for $6.95.
Faulkner Mfg. Co., RD 1, Diamond, Ohio

THIS GARDEN cart has room for usual tools plus a receptacle for debris; $16.95.
Franklin J. Scott, Dept. MI-2, Farmington, Washington

DISPENSER for soluble fertilizers can be adjuster for desired strength. Cost, $9.95.
Dearborn Lawn Products, Inc., 25347 Kean Ave., Dearborn 7, Mich.

for the man who has everything but...

THE HANDIEST PLIER OF THEM ALL!

CHANNELLOCK®

Your tool kit isn't complete until you own a CHANNELLOCK. Why? No other gripping tool does so many jobs so well . . . the reason why thousands of skilled mechanics—year in, year out—buy CHANNELLOCK in preference to any other plier. Available in three jaw capacities: ⅞", 1½" and 2". Ask your tool supplier for a genuine CHANNELLOCK Plier. If he's out of them, ask him to order one for you.

Write for Catalog of Complete Line of Pliers

CHAMPION DEARMENT TOOL COMPANY

MEADVILLE 3, PENNSYLVANIA

Sailboat Trailer

[*Continued from page* 136]

right for this trailer. To get this, support the loaded frame on a piece of pipe in line with the center crosspiece. Then put a bathroom scale under the front end of the frame. Move the frame on the pipe until the scale reads 25 pounds, making sure the pipe is parallel to the crosspiece. Then mark the frame for the position of the axle.

Remove the boat from the frame. Then, with the front and rear brackets attached to the springs, balance the frame on the brackets and block up the front end so that it is level. Move the spring and axle assembly until the axle is directly under the marks on the frame and then mark the positions of the front spring brackets on the frame. Be sure the rear spring brackets are vertical and then mark their positions on the frame. Then the spring brackets and the stem attaching bracket can be welded to the frame.

The trailer hitch is a lever-locking type welded to the front end. The mast clamps are made as shown with the hinges brazed or silver-soldered to the curved mild steel. They're padded with thick felt cemented with Pliobond after painting. Leave a gap in the felt at each side for the halyards and standing rigging. The rear clamp is attached to the top rudder fitting of the boat for hauling. The exact method will vary with the boat and the rudder fitting.

Finish the trailer with automotive paint. First clean it, then apply two coats of undercoating followed by two coats of the finish color. Wiring for taillights can be routed through the frame or clipped to the outside if you want to keep it watertight. Safety chains, available in hardware stores, are a must in most states and should be used.

When the trailer is finished and carrying the normal load, check the clearance between the top of the axle and the bottom of the frame. It should be about three inches. If it is more than this, remove one or two leaves from the springs. For towing, a tire pressure of 12 psi should be used. Higher pressure will only give the boat a harder ride and cause the center of the tire treads to wear faster. •

CHOOSE YOUR JOB TRAINING—THEN LEARN BY DOING!

Challenging work—if you can get it. To land a job as a Helicopter Mechanic, you need training. The kind of training you get through the Army Choose-it-Yourself System.

If you qualify (by passing aptitude and physical exams), this system lets you choose your job training before you enlist.

On-the-job or in school, Army training is practical. You learn by doing. The skills you absorb can pay off for the rest of your life.

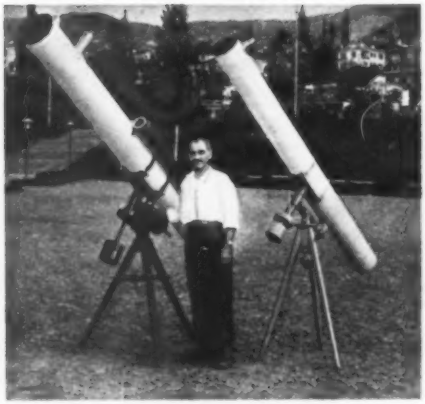
You can choose from many different kinds of job training. Aircraft Maintenance is one possibility. There's also Data Processing, Missile Operations, Finance, Automotive Maintenance, Communications Center Operations—to name a few. Ask your Army recruiter to show you a complete list.

Can you qualify for the job training you want? It's easy enough to find out. Before enlistment. Without obligation.

CHOOSE-IT-YOURSELF VOCATIONAL TRAINING SYSTEM **US ARMY**

ENGINEER'S youth belies age of model steam traction engine built over 50 years ago by Edward Dysart, Los Altos, Calif. 2 cylinders have 1⅛-inch stroke, machine weighs 35 lbs.

Golden Hammer Award Winners



CLOCKWORK mechanism fitted on 9½-inch telescope at left enables Hasip Sonmezalp of Bursa, Turkey, to follow the course of man-made satellites and heavenly bodies.

SPUTNIK is the name R. E. Beckwith, Duluth, Minn., has given to tracked vehicle built mainly for deer hunting and snow plowing. Tracks were conveyor belt—engine Ford V8.

BUILDING knowledge acquired from local library books helped Maynard Eide and wife, Kenosha, Wis., to complete this 3-bedroomer in 19 months of spare time work.

FIRST boat built by J. T. Hankins, Cleburne, Texas, for about $2,000 is 22 ft. fir and mahogany, outboard cabin-cruiser. Accommodation includes galley and four bunks.

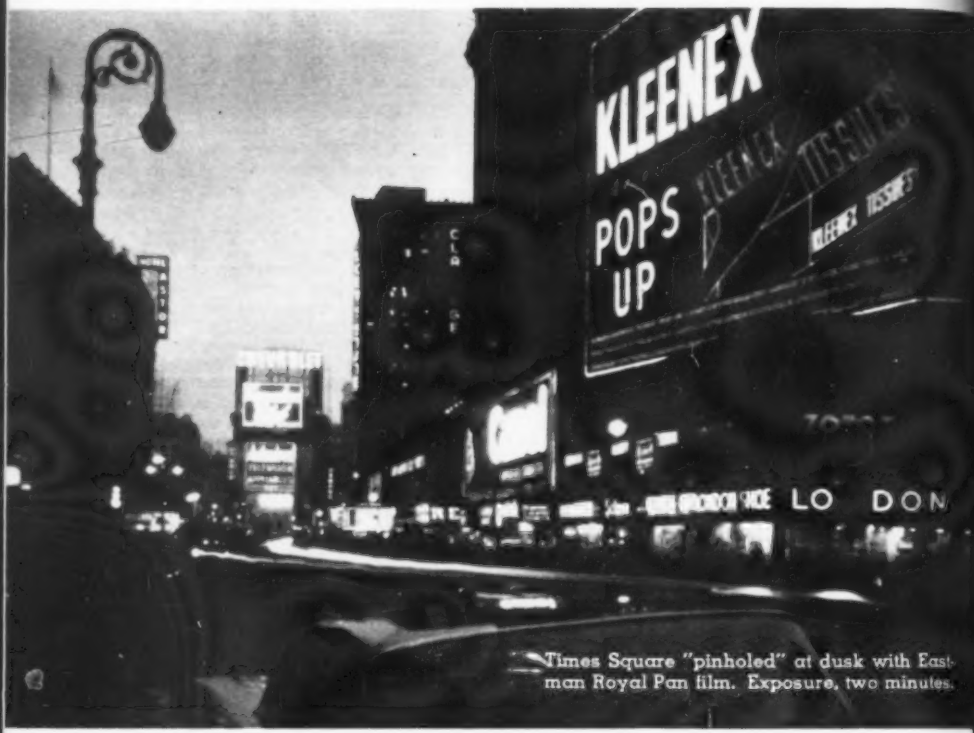
Each craftsman whose project is shown receives a 24-karat gold-plated Hammer and a Workbench Award Certificate. Runners-up will be sent a beautiful gold-plated Golden Hammer Tie Bar or MI's Certificate of Merit. So send us some *black-and-white photos, with negatives*, and a full description of your latest project. Photos of your workshop are also eligible. Send all entries, with return postage, to MECHANIX ILLUSTRATED Golden Hammer Awards, 67 West 44th St., New York 36, N. Y. Entrants are advised that MECHANIX ILLUSTRATED cannot accept responsibility for customs charges, duties, taxes, etc., levied against Golden Hammer and Golden Hammer Tie Bar winners outside the United States.

The following craftsmen have been awarded GOLDEN HAMMER TIE BARS for their projects: U. S. Anderson, Ma-Me-O Beach, Alberta, Canada • James G. Anton, Jr., Waterbury, Conn. • W. O. Bell, Mt. Pleasant, Texas • Robert L. Bondy, Mount Clemens, Mich. • R. Clarke, West Sacramento, Calif. • Russell Curtis, Austin, Minn. • Richard L. Dowler, Hudson, Iowa • Clarence Eales, Hutchinson, Kan. • Herman Hellman, Hartsburg, Ill. • Per Huse, Haslum, Norway • William K. Jewett, Jr., New York City • Charles G. Koch, Hempstead, N. Y. • S/Sgt. James W. Lambert, Seattle, Wash. • Herbert Lange, Ayrshire, Iowa • Sam Leonard, Oakton, Va. • Glenn Luck, Lafayette, Ind. • Hugh Martin, Cheektowaga, N. Y. • Frank Martino, Wantagh, N. Y. • John Pavlovich, Brooklyn, N. Y. • Michael S. Pratt, Thornton, Colo. • John R. Raines, Wilson, N. C. • Earl Ream, Clay City, Ind. [Continued on page 145]

BABY ACE, a favorite with MI readers is pride and joy of James E. Bell, Rochester, N. Y., who built her in two years for $1450. Flies 300 miles at 100 mph on 12 gallons.

STEREO console contains kit-built tuner and amplifier, mike, tape recorder, record player and three speakers—constructed in 150 hours by Nicholas F. Tocci, Bayonne, N. J.

SEE THE WORLD THROUGH A PINHOLE!



Times Square "pinholed" at dusk with Eastman Royal Pan film. Exposure, two minutes.

Made from a coffee can, the pinhole camera takes photos that are sharp from foreground to horizon.

By G. Grantly Wallington

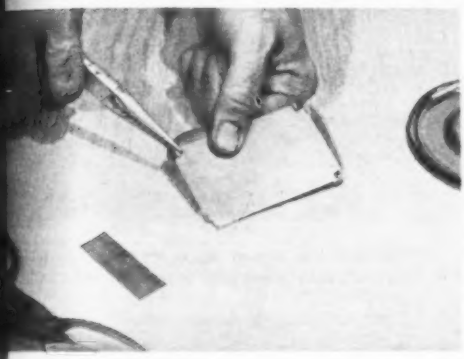
THE pinhole camera is the simplest camera that can be made. It has no lens, no mechanical shutter, no focusing device, no rangefinder and no viewfinder. It's merely a box with a pinhole at the front and a piece of film inside.

The unique feature of a pinhole camera is that everything from a few inches in front of it to the horizon is in focus. This makes it an extremely worth-while project for the hobbyist. Take the model railroader who wants to make realistic photographs right in the middle of his layout. If he tries using a conventional camera, he's plagued by the shallow depth of field at close range. The focus falls off rapidly and destroys the feeling of reality he is trying to capture.

The pinhole camera can be set down right in the middle of the model railroader's marshalling yard. If he wants a wide-angle view from that point, a shallow box with a film-to-pinhole distance of two to three inches will do. For a telephoto effect, greater distance is re-

SKATERS are slightly blurred in a shot made at 1/10th second in bright sunlight.

AWL is used to punch large hole in the bottom center of a one-pound coffee can.



FILM HOLDER is made from piece of tin. Corners are bent over to form film slots.

INSIDE of can is painted dull black so that there will be no light reflections.

quired from the pinhole to the film.

A one-pound coffee can makes a good pinhole camera. It's rugged, has just about the right film-to-pinhole distance for most uses and the cover is light-tight. The first step is to locate the center of the bottom and punch a pinhole at that point. A hole the size of a number ten sewing needle is best. As the size is increased, the pictures become more fuzzy. Too large a hole only acts as a window to let in light without forming any image. Too small a hole will also give a fuzzy picture because of the diffraction of light.

If you want to experiment with holes of different size, cut a larger hole in the bottom of the can and punch pinholes in a separate piece of thin metal or black paper. The metal or paper can then be taped over the larger hole. In effect, this gives you changeable lenses for extremely soft photographs or the sharpest ones possible.

The film must lie flat and centered inside the lid of the can. For convenience, make a film holder from a piece of tin a half inch longer than the film. (2¼x3¼ sheet film is a good size to use.) The ends of the flat piece of tin are bent over to form slots into which the film slides. Then the holder is sweat-soldered to the center of the lid.

The next step is to paint the entire

inside of the can a flat, non-reflecting black. Kodak Brushing Lacquer No. 4, Dull Black, is good for this purpose since it was created especially for photographic use. It also dries rapidly.

The "shutter" is the last thing to be added. All you need is a piece of black tape large enough to cover the area of the pinhole. To make the exposure, the tape is lifted from the hole and then replaced. Exposures are not too critical, most of them being about one or two seconds with a fast film.

It's best to use films such as Kodak Tri-X or Royal Pan. Tri-X roll film can be cut up to fit the holder. Royal Pan film is available only as sheet film. Because both of these are fast films, you have to handle them with care, allowing no stray light [*Continued on page* 152]

NO. 10 NEEDLE is used to make pinhole in piece of paper or very thin aluminum.

LENSBOARD is taped securely over large hole previously punched in bottom of can.

BLACK TAPE over the pinhole serves as shutter. It's lifted to make an exposure.

SHEET FILM is slid into holder inside lid. This must be done in total darkness.

Rear Axle Ratios

[*Continued from page* 129]

of teeth on these two gears.

Since much of the car's performance and economy has to do with operation in the lower gears it is important to consider transmission ratios. Here we find quite a variation. The manual gearbox of the 1961 Corvair, by way of illustration, uses a 3.50 ratio for Low. This compares with 2.70 for Low on the 1961 Dodge Dart and Lancer Six-cylinder jobs. The 4-speed Corvair transmission uses a 3.61 ratio for Low (or First) whereas the current 3-speed box for Falcon uses 3.29 Low ratio for both the 144-cu.-in. and 170-cu.-in. engines. However, for Falcon there are four rear axle ratios available: 3.10, 3.50, 3.89 and 4.00.

In trying to figure out why there are such wide variations in ratios you may jump to the conclusion that less reduction gearing can be used if the engine is more powerful. That may not be true. The Dodge Polara rates 265 hp for its standard V-8 engine as against 230 hp for the V-8 Dart, yet their Low gear manual transmission ratios are 2.55 and 2.12 respectively. Both cars use 14-inch tires. Their weights, however, are different—the V-8 Dart Seneca model weighs 3,515 pounds as against 3,700 for the Polara. The explanation for the Polara's standard shift Low gear reduction is found in the car's standard rear axle ratio of 3.23 which compares with the 3.58 for the Dart.

We find a similar difference in the rear axle ratios for these two models where the automatic transmission is used. Polara's reduction is 2.93; Dart's is 3.31 (for Power Flite). For taxicabs, Dodge uses three different Low gear ratios for its manual transmission. We can readily see how far off the track we can be in assuming that engine differences alone account for differences in performance and economy.

Here is a way to determine *transmission* ratios. Remove the clutch housing pan and chalk the bottom of the clutch disk. Put the gearbox in Low, have a helper press the clutch pedal down and then turn the propeller shaft slowly while counting the number of times the clutch disk rotates. For example, if the transmission has a Low gear ratio of 2.12 the propeller shaft will turn one revolution while the clutch disk makes about 2⅛ turns.

In a manual transmission second gear ratios are always less of a reduction than Low, but some Seconds in manuals are actually more of a reduction than the Low in automatics. Corvair's manual Second is 1.99 while Low in the 2-speed Dart is 1.72.

To find the total gear ratio of your car for Low, Second or High simply multiply the transmission gear ratio by the rear axle ratio. That really gives you the picture. With automatics there is the added advantage (as far as power is concerned) of slippage as well as torque multiplication. Slippage is not a useful factor with mechanical clutches.

Gear ratios tell us quite plainly that regardless of the rated number of "horses" under the hood, the internal combustion engine still is dependent on speed for its ability to provide performance. This is true even with the automatic transmission or torque converter. The question for the designer is how much aid the engine will need to give the car the performance characteristics it needs and without sacrificing economy by making the engine either "lug" on hills and during acceleration, or rotate too many times per mile traveled.

For you—the car buyer—it's a matter of making certain you get the rear axle ratio you need and the gearbox type and ratios that go best with it. •

Golden Hammer Awards

[*Continued from page* 141]

• L. J. Roberts, Detroit, Mich. • Robert D. Satrapa, Omaha, Neb. • Dr. Sherman W. Schultz, Jr., St. Paul, Minn. • James N. Sightler, West Columbia, S. C. • James O. Stull, Mechanicsburg, Pa. • William J. Tomecek, Wantagh, N. Y. • Alfred G. Tuttle, Midland, Ontario, Canada • Robert L. Whitmill, Paradise, Calif.

The following craftsmen have been awarded CERTIFICATES OF MERIT for their projects:

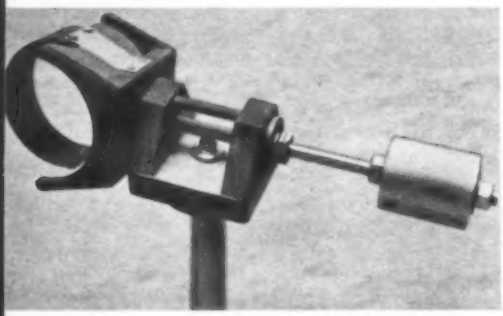
Louis D. Hays, Independence, Mo. • Richard M. Loff, Westminster, Calif. • Don McBride, Sunnybrook, Alberta, Canada • Nickolas Milone, Canonburg, Pa. • W. G. Nowman, Port Hueneme, Calif. • Hugh O'Neill, Bronx, N. Y. • Roland Rousseau, Newmarket, N. H. • Arthur E. Smith, Bronx, N. Y. • Earl Underkoffler, Perkasie, Pa.

Look for the names of more winners next month.

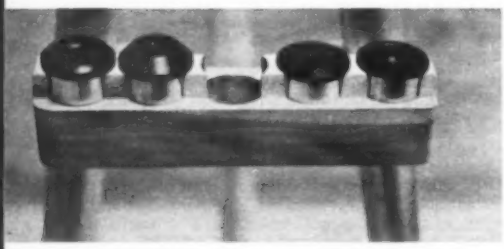
The Amateur Telescope Maker's Page

LIGHT WEIGHT EQUATORIAL TELESCOPE

AT THE BUSINESS end of Mr. Welt's 'scope. Its focal length is 19½ inches.



CRADLE is part of a piece of Micarta tubing. It permits smooth tube rotation.



RACK for holding five eyepieces is made of hardwood, it fastens to tripod legs.

TELESCOPES are fine. But, after the first flush of enthusiasm for observation in the back yard is worn off, what then? Take it along with you in your car? Fine. But the weight of a sturdily built telescope can be its own deterrent.

Mr. William G. Welt, an optometrist of Modesto, California, solved the problem rather neatly by designing and building a light-weight equatorial telescope that weighs only 12 pounds, including a two pound lead counterweight.

The objective lens of Mr. Welt's telescope is 3⅛ inches in diameter. It is a coated achromatic lens with a focal length of 19½ inches. While Mr. Welt's did not indicate in his letter what the focal lengths of the eyepieces are, an inspection of the very fine photographs which accompanied his letter would seem that they range from a quarter-inch to one inch in focal length. Roughly then, the power of the telescope varies from about 80 times to 20 times.

The eyepiece holder is rather ingeniously designed out of hard wood and is clipped to two of the tripod legs as shown. For ease of observation, a

coated prism is used at the eyepiece end of the telescope as shown in the large photograph.

The cradle consists of a piece of Micarta cut from the same tube from which the four inch O.D. telescope tube is made. The cradle makes a snug fit around the telescope tube and with just a little coaxing the tube can be rotated for the best observing position.

An innovation is the use of a central pillar for up and down movement. Raising the telescope on its tube, permits it to be swung to any position without mechanical interference from the tripod legs.

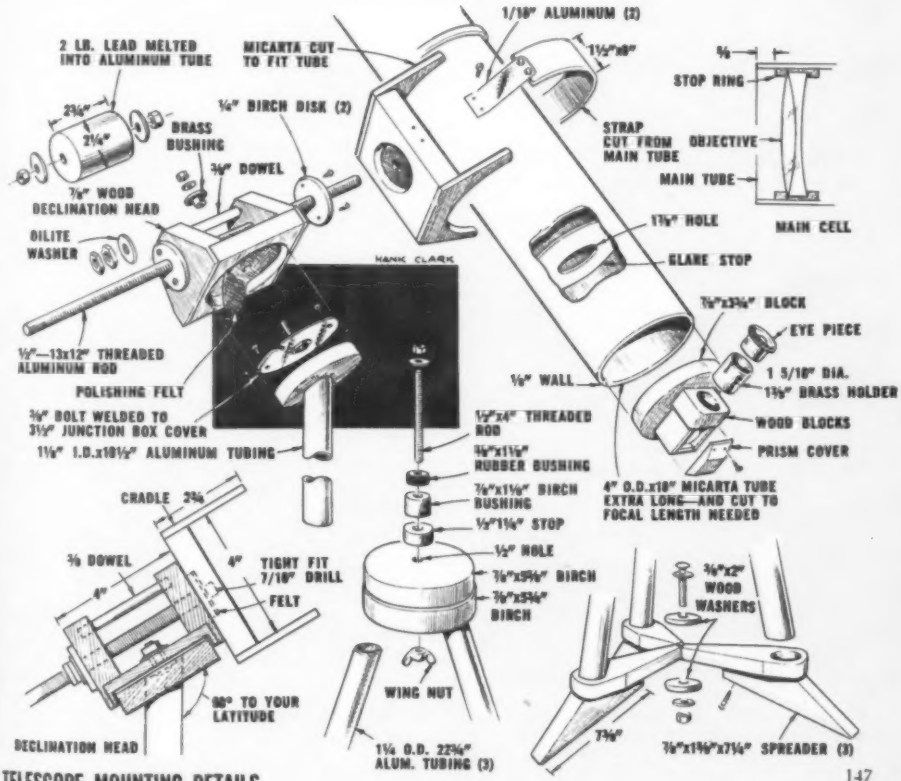
The elevating mechanism consists of a half-inch threaded steel rod. See the center of the drawing for details. Such threaded rods in thicknesses up to ¾-inch and in lengths up to 36 inches are available from the Redi-Bolt Co., 5348 Indianapolis Blvd., E. Chicago, Ind.

The counterweight consists of two pounds of lead cast in a tin can. After cooling, the metal was cut away.

War surplus objective lenses suitable for making such a telescope are available from the Edmund Scientific Company, 101 E. Gloucester Pike, Barrington, N. J., or A. Jaegers Optical Co., 691 Merrick Road, Lynbrook, N. Y.

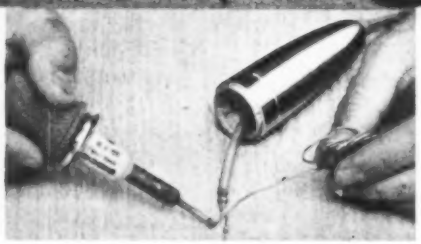
TELESCOPE PLANS

If you would like to go into the fascinating hobby of telescope making, send $2 to Mechanix Illustrated Plans Service, Greenwich, Conn. Ask for Plan No. 8, Ten Dollar Telescope. This easy-to-follow plan describes the construction of a six-inch reflecting telescope with enough power to see the polar caps of Mars and the rings of Saturn.



TELESCOPE MOUNTING DETAILS

MICROPHONE COMES IN A KIT

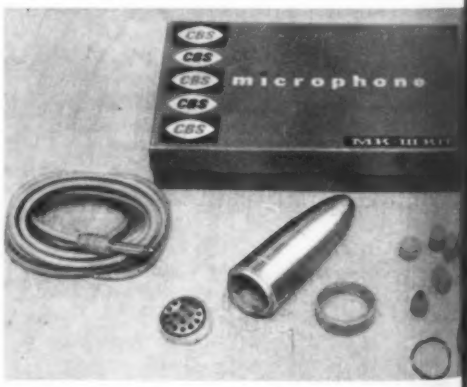


LUGS are soldered to cable. Soldering directly to cell could damage it.

FOAM PADS are placed in the cell housing to cut down standing waves.

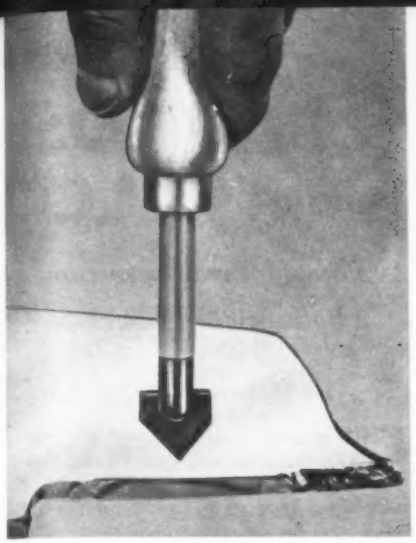
CELL is fitted to housing. Rubber gasket and a cap are placed over it.

PUTTING your own mike together is easy with a CBS Mark III kit. All you do is solder a couple of lugs in place and assemble the few components. Ideal for tape recording, Citizens Band Radio or a public address system, the ceramic microphone has a sensitivity of -52db below one volt per microbar at 1,000 cps and a frequency range of 30 to 10,000 cps. Bass response can be increased by drilling a small hole in the case and reduced by closing the hole with a self-tapping screw. The kit costs $7.50 and is made by CBS Electronics, Danvers, Mass. •



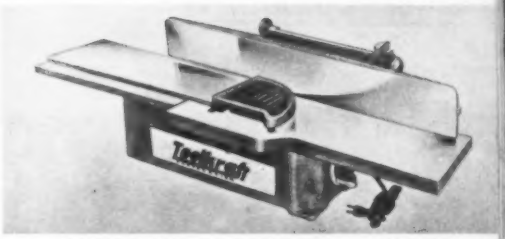
KIT includes everything needed to assemble microphone. All you need is a soldering iron.

MI's HARDWARE STORE



HAND-OPERATED drill can make holes in glass. Made in 1/32nd to one inch sizes.

Smith Engineering and Tool Co., P.O. Box 94, Glen Ridge, N. J.

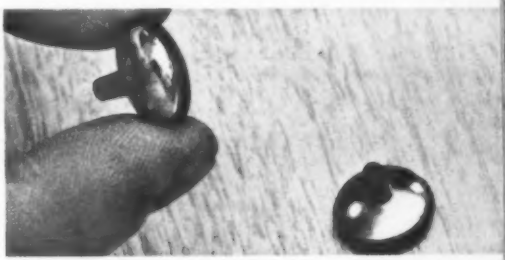


SIX-INCH jointer has ¾ hp built-in motor. Will make up to half-inch cut on one pass.

Toolkraft Corp., 700 Plainfield St., Springfield, Mass.

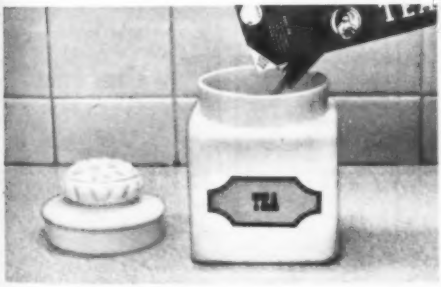
PLASTIC ELECTRICAL tape is supplied in dispenser which cuts it to wanted length.

Dutch Brand Division, Johns-Manville, 22 East 40 Street, New York 16, N. Y.



FAUCET WASHERS have brass seats to take wear. They rotate, no set screw is used.

Ever-Wear Seal Co., Box 592, Lake Geneva, Wis.



PLASTIC CANISTER sets are made to resemble milk glass. Four-piece set, $3.95.

Mark-Tone Plastics, Inc., 245 Fourth Street, Passaic, N. J.

PLYWOOD PANELING is protected with polyester film. It is factory installed and invisible.

The U. S. Plywood Corp., 55 West 44 Street, New York 36, N. Y.

BACK PACKING is mutually satisfactory to Vermont builder Richard Bell and son.

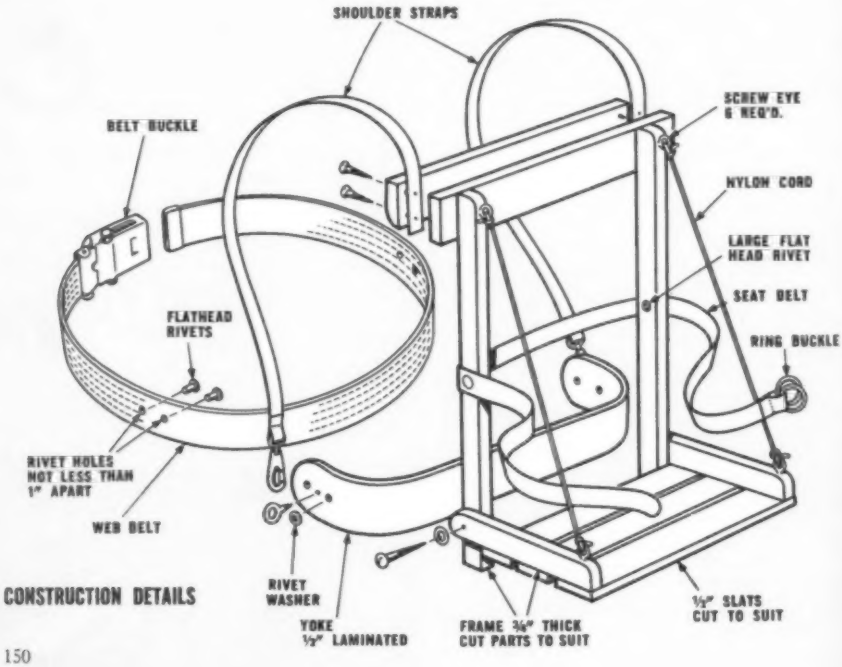
PAPOOSE RACK

Tote a tot in comfort on a lightweight pack rack.

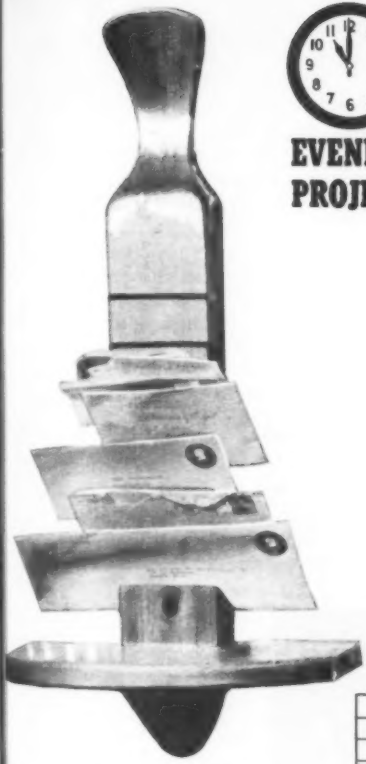
By Robert L. Hagerman

THIS easy-to-build pack rack is great for toting children one to two years old. By crossing straps, it can also be hung on a tree as a high chair.

All wooden parts are ash, with the curved base piece made by steam bending four ⅛x3-inch strips and then laminating them, using glue and clamps on a form. The web belt, while riveted to the base piece, does not follow its contour; instead, it stretches across the U so that it bears on the back rather than the wood. All dimensions, of course, are gauged to the individual. •



CONSTRUCTION DETAILS



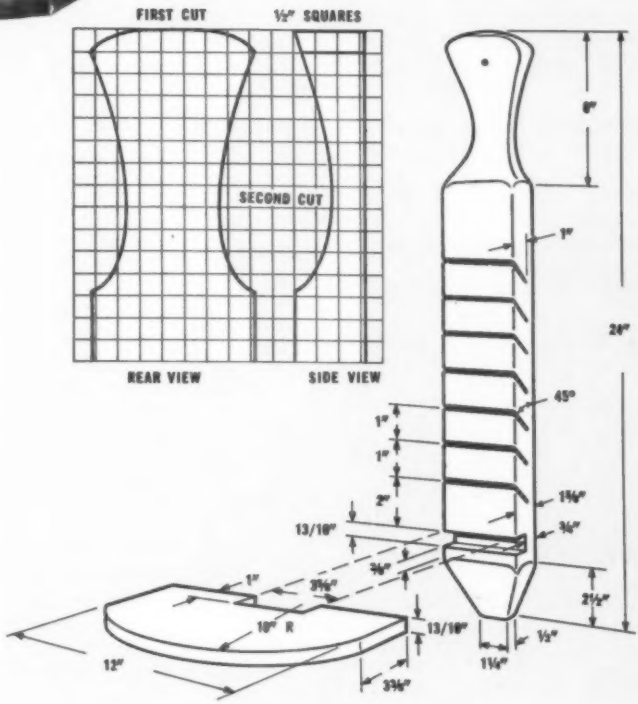
EVENING PROJECT

Letter Rack

THE mail, shopping lists, reminders or bills to be paid are always easy to find if they're slipped into this handy rack which also has a shelf for keys and other small items. Make it from 2x4 and 1x10 knotty pine stock. Construction is clearly detailed; just note that the top is cut in the two steps indicated on the graph drawing. For thick envelopes, it would be good to make a few slots double the width of a saw kerf. Round all corners and complete the job with a pine finish, making sure the stain gets down to the base of each slot.

—*Bill Christiansen*

EARLY AMERICAN in character, rack is a decorative and useful item to have in an entrance hall.



LETTER RACK DETAILS

MI Builds A Garage

[*Continued from page* 111]

coats, etc. A sliding door separates the vestibule from the garage. The door is suspended by sliding door hardware made by the Grant Pulley and Hardware Corp. of West Nyack, N. Y. The nylon roller bearings and this hardware make it extremely easy to operate. The sheetrock walls were then put up and the joints cemented and sanded. The vestibule walls were then primed and painted.

Kentile Sunny Buff vinyl-asbestos tile was used on the concrete vestibule floor. Kentile No. 10 adhesive, applied with a brush, was spread on the floor and the tiles pressed into place. Molding to dress up the vestibule was stained and nailed.

The garage has an estimated value of close to $2,000. Aside from cost, it enhances the appearance of the house and makes the front entrance far more appealing than the original shed which was torn down before the work began. If you plan such a project, or a similar one, you might consider doing the work yourself. If you do, you'll not only save about 50 per cent in costs, you'll also derive tremendous satisfaction from building it. •

SPACIOUS garage has room for a workshop area, playthings, tools, and the family car.

Wind Speed Indicator

[*Continued from page* 124]

Using as light a wire as possible, attach one of the leads from the generator to the middle pole of the volume control. From the adjacent pole on the control run a wire to the nearest outside pole of the three-pole switch. Another wire is attached from the negative terminal of meter. When remaining lead from generator is made fast to positive terminal you are ready to test anemometer by hand-spinning crosspieces.

Should the meter fail to register: (1) check all connections; (2) click the switch to another of its three positions; (3) turn the volume control clockwise until it stops; or (4) reverse the silicon diode.

To calibrate the meter you must make a conversion chart. Compare the readings on the meter with your speedometer to translate the amperes into miles per hour. The chart made from the results of this test will have two columns: one in the 0-30 mph range, the other from 30 mph up.

Choose a calm day to mount the generator assembly to the window post of your car. Get a friend to take the meter readings while you drive. Above 30 mph the needle will go off the dial, so desensitize it by tuning down the volume control.

Install the generator and wind-cup assembly on a high point of your roof and the microammeter at a convenient location inside the house. •

World Through Pinhole

[*Continued from page* 144]

to reach them during loading and unloading. If you don't have a light-tight closet or a darkroom, use a changing bag.

The emulsion side of the film must face the pinhole. You can tell it by touch. The back of the film has a glossy feeling and the emulsion side has a satin-like smoothness.

With the camera loaded, you're ready to shoot. Aiming, of course, is simple. Exact exposure is best worked out by experimentation. However, you can be reasonably certain of printable pictures with an exposure of two seconds in bright sunlight. Indoor pictures can be made with exposures of five to ten seconds, using a number two photoflood about three feet from the subject. Always use a camera support. •

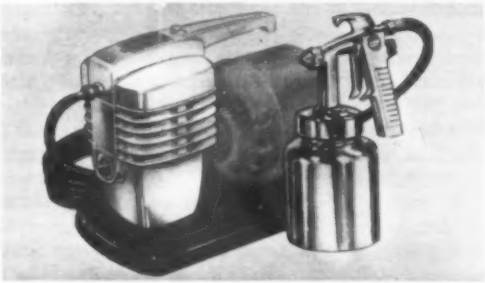
NEW "PAINT" PRODUCTS

POLLYSAKS are polyethylene bags made in roll form with perforations for tearing apart. They are designed for storing brushes between jobs.

Kennedy Car Liner and Bag Company, Inc., Shelbyville, Ind.

NEW ALL-PURPOSE clear finish, Varmor protects screens and wood surfaces. It also comes in cans for brush application.

Pratt & Lambert, Inc., Tonawanda Street, Buffalo, N. Y.



LOW-PRICED SPRAYER sells for $29.50 without motor. Outfit includes gun, compressor and ten feet of hose. Uses ¼ hp motor with ½ in. shaft.

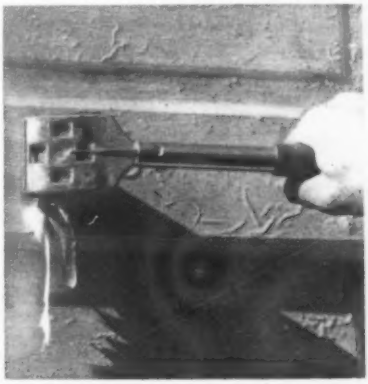
W. R. Brown Corp., Chicago 35, Ill.

BRO-KADE wall decorating kit for wallpaper effect on ordinary painted walls.

Bro-Kade Wall Finish Company, Inc., 1322 South 16 St., Milwaukee 4, Wisc.

PAINT ADDITIVE, Proflo, cuts brush and roller drag; doesn't thin paint.

DeMert & Dougherty, Inc., 1600-10 Clark Ave., St. Louis 3, Mo.



PAINT SCRAPER, has two-inch replaceable blade and five-inch steel handle. It sells for $2.

R&R Enterprises, Inc., 3214 West North Ave., Milwaukee 8, Wisc.

The Amphicar

[*Continued from page* 80]

see it.

Back to the Amphicar . . . Our test job was being shown for the first time at the Miami Boat Show so I went there to try it out. The test car or boat (take your choice) was painted a beautiful red and was a neat-looking package. In fact, it had better lines, propellers and all, than many of our so-called sports cars. Additional nautical equipment included port and starboard running lights on the hood and a Coast Guard approved stern or transom light. When you get in with the intention of water travel, there is an extra lever on each door that you pull to make the door absolutely watertight. In other words, if you are going to the supermarket to pick up a pound of mice, the conventional car lock is all that's needed to keep the door shut. But when going to sea, the additional lever pulls the door tighter against a rubber seal and it becomes a watertight bulkhead. The whole action consumes less than two seconds.

The water drive is by two propellers, just in case you clomp one on a snag, and if the going gets a little rough and you slop some water aboard, an electric bilge pump operated by a toggle switch gets it out. The steering while in the water is the same as on land. If you cut the wheels to the right (sorry, mate—to starboard) you go to the right, etc.

One nice accessory was Lynn Vinocur, a model, who was on hand for the photos we took. She was familiar with the Amphicar operation and knew what levers to pull for what. Lynn and I took to the water at Dinner Key, south of Miami, and after a bit of gear changing, off we went. This rig has plenty of buoyancy but it's not the vessel I'd choose for a deep water cruise in a 30-knot wind. On still water this pot goes along surprisingly well, though it won't be a Gold Cup contender, and the odd steering control is amazingly accurate. In fact, I have handled a lot of real out-and-out boats that didn't steer as well.

The guy who owns one of these at any of our thousands of lakes this summer will be the hit of the season—make no mistake about that. Also think what a handy barouche this would be for out-running the cops or the revenue boys. How do you throw a road block over a creek or lake? Another thing I didn't get straight: I know you have to have an automobile license for it but how about Coast Guard numbers or a small boat permit? And another question, how can Uncle Sam's hot-cat tax boys decide whether you're driving on a Federal Highway with gas you bought for a boat—which calls for a tax rebate in most states. Oh well, solving these little problems should keep the Washington tax kids out of the pool halls.

Performance-wise, it's no Ferrari when in its automobile suit. The rear-mounted, four-cylinder mill develops 43 hp and this pushes it over the ground at between 65 and 70 mph. The manufacturer claims 32 mpg as a car and ten mpg as a boat. I feel the last figure is jam-packed with optimism, unless you have about an eight-knot current running with you. Speed on the water is said to be ten mph. I feel a little current would help here, too, though it does move along quite nicely.

One of the big questions about this wet-back is how do you get it ashore on marshy or rocky banks? This is not a four-wheel-drive Swoose but a two-wheeler with conventional highway tires in the rear. I launched and landed it from a boat ramp—but how about a beach? If the sand is hard packed, fine. But if it's soft there might be some doubt. The technique even when landing on a boat ramp is to come ashore fairly fast, letting the propellers drive you in as far as possible, then shifting gears into wheel drive. Now, on a mud bank, especially one with a fast dropoff, this may take some doing. But enough of this spoilsport attitude. You can find a launching ramp on just about every lake and if you can't, most lakes have flat paths that lead into the water. In other words, though you might have to poke your nose into a few spots before you locate the right footing, the chances are you'll find it before the Coast Guard boys catch up to you.

This carboat has an excellent canvas top, easy to put up. The roll-up windows will prove handy in keeping spray from parting your hair. It is a very well thought-out specialty snorter with a limited market. Its

principal purpose in life is to be a fun and sporting car. It could become truly functional to own in some parts of our country where floods take over the land at quite frequent intervals. Under these conditions you could jump in your trusty Amphicar and cruise around until they bailed out the house.

The Amphicar is built in West Germany by a group that is also associated with Mercedes-Benz. In the short time I had to test the car I found it to be well-built. It is 14 feet, two inches long and five feet, one inch wide. It has a clearance of nine-plus inches and weighs 2,240 pounds. The transmission is four-speed synchromesh and the water drive has a forward and reverse.

To sum up, this is a car that's different. The price tag of $3,400 doesn't seem out of line considering what it is and does. This is not a unit that I would want under me in a choppy bay or on big water in a blow, but some jerk will undoubtedly set out for Bermuda or Spain in one before the year is out—just to keep the Coast Guard on its toes. In summing up the summing up, the fact that you can buy a good compact car plus a boat, motor and trailer for about the same dough and end up with a better boat and a better car won't alter the appeal the Amphicar will have for many people. And just think what a rally or cross-country race you could have with a dozen or more Amphicars. Glug-glug-glug! Forgot to lock the door! •

McCahill Tests Newport

[*Continued from page* 84]

On the road this job handles and controls with all the ease of inheriting money. Although the suspension is excellent I felt the torsion bars could have taken a little winding up. On the Daytona sports car course, where I tested it, there was just a little more roll than with my 300 over the same route. Anyway, as most of you know, Chrysler can give aces and spades to any other manufacturer in America and still win as far as suspension is concerned. The ride is strictly big-car stuff and railroad crossings and pot holes are sopped up like spilt milk in a cat factory. These are the cars to be in when an emergency arises. If you have to take to the road shoulder or ditch or throw your car into a spin to avoid annihilation in a head-on crash, your chances are lots better with torsion-bar suspension.

Recently, on a rainy Saturday night I was returning to Florida from a quail shoot at Claude Cook's in Hazelhurst, Ga. The road was slick with a mud film that had floated across it from one of the high-banked shoulders. It was about 10:30 at night and I was tired, having spent a long day in the field. Suddenly I became aware of some action on the highway up front. Then my headlights picked up what looked like a solid wall across the road some 200 yards ahead. I was driving my Chrysler 300 and doing about 65. I hit the brakes but it was no go—the road was too slick from the mud slime to get a grip. I threw the 300 into a long broad slide, right down the center of the road, corrected and got it back in line. Now I saw the wall was only about 40 yards away and I was still doing about 40, so I cut hard for a spin. One complete loop and I was able to bring the 300 to a stop less than four feet from the wall, which turned out to be the bottom side of a huge trailer-tractor that had just jack-knifed and flipped on its side, blocking all passage on the narrow, two-lane road. It was the terrific Chrysler suspension that allowed me to pull the 300 out of this situation. In any one of a dozen other less able road barges I would have been in real trouble without an exit.

Stylewise, the Newport is Chrysler all the way and unless you are a real Chrysler-phobe you'd be hard pressed to tell which model it is. It's only four inches shorter than the New Yorker overall and just as wide and roomy inside. This car will appeal to a lot of buyers who want that certain amount of prestige that goes with owning a Chrysler, plus very good performance over the ground, and all on regular fuel.

The Newport isn't the fastest car on the road in its standard suit but it's also a long way from being the slowest, and it certainly won't cause you any embarrassment at a traffic light. With the standard engine and regular gas the Newport will crank out zero to 60 mph in ten seconds flat—and, as you know, that's still pretty good. Top speed is better than 110 mph and on the road it will whip up from

[*Continued on next page*]

40 to 60 in 5.1 seconds which will get you by the oxcarts pretty fast. All performance speed tests were made at the Daytona Speedway and for spins and handling control I used the sports car course and the beach.

I hate to condemn this car with the swashbuckle set by dubbing it a real practical automobile but that's just what it is from almost all standpoints. It has some faults—such as the head-roasting feature of the rear window and a real phony glove box. The glove compartment has a tremendous door that, when open, reveals a small hole on one side and that's it. The rear window is slanted out to catch all the sun's rays when you are heading north. This can become pretty uncomfortable on a hot summer's day if you happen to be hauling your mother-in-law in the back seat. Of course, tinted windows will cut this down some and so will venetian blinds but still it seems a little silly.

In summing up, I think, all things considered, that this is a hell of a buy for some people. The performance is such that unless you are in the business you might easily think it could take anything on the road. Zero to 60 in ten flat, and plenty of torque in the upper ranges, make this a top-flight performing rig at a price and without any sacrifice of comfort. It is roomy, comfortable, well-styled and expensive-looking and can go coast-to-coast and back on the cheapest pump fuel. The upholstery is good and the general fittings are up to the best Detroit standards, which I'll admit isn't giving it much. In summing up the summing up, the Newport is a car that looks as if it costs a lot more money than most of its competition—and when you look still further, it drives as if it cost more, too. •

Make Way For Junior

[*Continued from page* 65]

you have ever experienced before, even if you are accustomed to driving sports cars.

When the first Formula Junior prototypes were built and run, mostly based on components from the Fiat 1100 sedan, there was no rush of manufacturers to build them. This was probably because the makers best equipped to do so were busy building Formula I or championship sports cars. But then two things happened:

First, the Formula II came back into prominence. Second, the F.I.A. announced that Formula I for the 1961 Grand Prix would limit engine displacement to 1500 cc. This made Formula Junior building a good way to test designs for the bigger babies, which were no longer so much bigger.

A good supply of Formula Junior cars to race got lots of drivers interested and encouraged more builders to build them. Soon the Junior was in full swing. In England Formula I and II firms like Cooper, Lotus, Elva and Lola began to develop Formula Junior rigs. On the Continent there appeared the Stanguellini, a front-engine, rear-drive job using a modified Fiat 1100 engine. Also Juniors by Peugeot, Lancia, DKW. Choices of engine—forward engine with front drive, forward engine with rear drive or rear engine with rear drive—all give the customer and would-be customer plenty to mull over.

You will now want to know how you can get involved in this exciting sport and what it's apt to cost. Well, the cheap way is to have a friend with a Junior who is willing to let you drive it. Then all you do is contact your local sports car or road racing club and check on their requirements for membership and for earning a competition license. You will have to enroll in a driving school and practice your technique under the watchful eyes of some of the veteran competition drivers in the club. If you have never done any kind of racing it might be a good idea to get a license on a small-displacement sports car first—this can be accomplished in a couple of months if you have the talent—and run a few local sports car races before moving up to the Junior. Then with the competition license already in your possession, all you need do is to practice on the Junior until you are confident and proficient enough to go racing in it. Many sports car meets now include at least one separate race for Formula Junior cars and there are also several organizations across the country specifically devoted to Junior racing.

This is the inexpensive way to get into Formula Junior—open to a few who are lucky but not rich. For those who must acquire their own cars, there is no painless way in unless you have money—even

though many people once hailed the new formula as the first step towards "poor man's racing." A new Junior will cost you anywhere from $2,800 to over $5,000 and to this will be added the cost of a trailer for carrying the car from race to race as well as tires, spare parts, entrance fees, etc. On the other hand, most successful sports car race drivers also indulge in trailers and the like to avoid knocking their race-tuned cars out of whack on the highway and many a production sports car, even in the smaller displacement classes, will end up costing more than a good Junior.

If you can afford to race at all, you can most likely afford to get into Formula Junior. You may have to start with a good used machine.

If you are really ambitious you might consider building your own Junior "special." There are literally dozens of these in the works all over the country right now. Unless you are pretty hot stuff as a designer-craftsman you don't figure to stand much of a chance of building a car that will take the measure of the professional jobs, especially with the minimum weight rule in effect, but you might have fun trying.

However you manage it, I suggest that you investigate Formula Junior. At the very least it's a great spectator sport and if you ever plan to do any racing at all you are never going to get a better opportunity than right now. You can still get in on the ground floor of the purest and most exciting form of motor racing to hit this country in the last dozen years. •

Man Who Wouldn't Quit

[*Continued from page* 91]

and applied for a patent—step two, and an essential one.

The patent secured, he looked around for a market (step three). Now, is it better to try and interest a large, reputable firm in your invention or to produce and market it yourself? Andy obtained an interview with an executive of one of the biggest manufacturers of electrical appliances. While the executive appeared interested in

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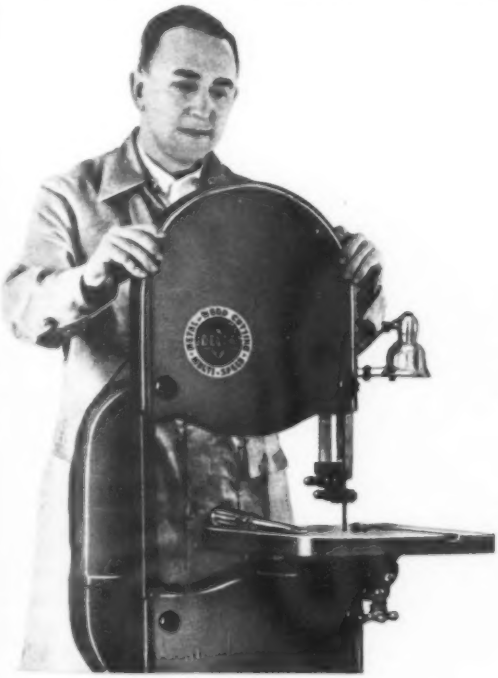

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Andy's idea, he finally turned it down on the ground that the iron's aluminum face plate would oxidize and smudge any garment it touched. He recommended Andy make the plate of stainless steel or chromium.

Andy left, completely disheartened. Both stainless steel and chromium were too heavy and too expensive, and he felt that all his efforts had been given to a lost cause.

It was his wife who got him over this hurdle. She simply plugged in the iron and used it on every piece of white material she could find in the house. Not even Andy's sharp eyes could find a trace of smudge on any of them. The iron's highly polished aluminum face plate did a beautiful ironing job. But once again Andy was thrown back on his own resources—and into step four of his plan.

Without hesitation he approached a man he knew only by reputation as being willing to invest money in people with promising ideas. Regarding this move Andy says: "You have to have enough faith in what you are doing so that it becomes a project wholly apart from yourself. Don't feel that you are asking someone to help *you*, but rather that you are inviting *him* to share in a worthwhile enterprise." The proof of Andy's theory was that he soon had enough backing to allow him to proceed.

He worked day and night perfecting his idea. His integrity was involved and he was determined to make his brainchild into a quality product. This insistance on quality constitutes step five.

The iron had to be easily removable but also lock securely into place when in use as a suitcase handle. He gradually worked out the "bugs" until at last the product met his own high standards of excellence. All told, the Iro-Case had cost Andy about $61,000 of borrowed money and too many hours to count.

Step six was to market-test the product. Public acceptance is the proof of any pudding—or new product. Andy embarked on a lengthy selling trip and succeeded in rounding up enough prospective orders to convince him that his Iro-Case was a promising bonanza. The future looked rosy. Andy had his product, the machines for making it, a place to manufacture it and orders waiting to be filled.

Then one bright morning he phoned the company from which he bought aluminum—and his world came crashing down around his head. The war in Korea had eliminated aluminum from the market except for essential products, and luggage was rated a luxury. Andy was out of business, deeply in debt and without a job or a future.

He squeaked through this period by running a machine shop and tutoring pupils (Andy had been a teacher)—and just stuck it out. "The sheriff called on us so many times with writs of attachment," Andy recalls, "that he became a personal friend."

Today all that is in the past. With the war's end, the machine shop reverted to its original purpose and Andy picked up where the war had cut him off.

His firm, now known as Weller, Inc. of Manchester, is affiliated with the internationally known Weller Electric Corporation. His original plant has doubled in size and today occupies more than 10,000 square feet of floor space. His 17 employees will turn out about 100,000 units next year, for all of which there is a ready market. Andy's annual income from the business tops $15,000—about five times what he made as a teacher.

It has been a long hard pull from Andy's original annual production of about 1,100 units to his present success and volume sales. His final word on the subject covers step seven of his plan: "Faith and hard work still pay off in America as well as they ever did." •

Airliner Takes Off

[*Continued from page* 69]

propellers so that they create virtually no forward thrust and absorb very little power from the engines. As the engines rev up to full speed, the two air compressors are clutched in and air is ducted through large pipes along the inner part of the wing and up to the rotor hub. From there, the air is fed into the rotor blades through pipes running through each blade to the tip-jet at the end of it. The air is then mixed with kerosene (also fed through a pipe running inside each rotor blade) and ignited by a spark-system. The combustion at the tip of each blade creates

a thrust—just like that of any jet engine—which drives the rotor.

When the rotor is running at full speed the Rotodyne takes off like a helicopter. At a pre-determined altitude (generally about 900 feet), both propellers are brought into positive pitch to provide forward speed. Then the clutch is disengaged, stopping the compressor. The air supply to the rotor thus dies out and the tip-jets are extinguished. All the power is now taken up by the propellers and the plane flies as a conventional twin-engine airliner.

During high-speed forward flight, the rotor is in auto-rotation. That is, it continues to rotate, providing some lift for the plane, but it does so without power.

As forward speed is increased, the relatively short wings of the Rotodyne take over much of the job of providing lift. At a speed of about 185 mph, some 60 per cent of the lift is carried by the wings. In the prototype, wingspan is 46 feet, six inches. In the production model, it will be increased to 75 feet.

For a helicopter-type landing, the entire process is reversed. Forward speed is decreased to about 110 mph, the pitch of the propellers is gradually reduced, the compressors are clutched in and the tip-jets relit—enabling the Rotodyne to be brought in for a vertical landing.

To insure safety in the event of an engine failure, the stream of compressed air coming from one engine never mixes with that coming from the other. Thus, as long as one engine is running, the rotor will be driven with sufficient power to allow a safe vertical landing. In the unlikely event of both engines going out, the auto-rotating rotor and the wings provide adequate lift for the plane to be glided down.

According to Squadron Leader W. R. Gellatly, Chief Test Pilot for the plane, the Rotodyne is very stable in flight and handles as gently as the old tried-and-true DC-3. "What's more," Gellatly says, "passengers who have flown on some of our test flights have never even been aware of when we switched from vertical

[*Continued on next page*]

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to forward flight. That's how easy it is."

The pilot's controls are a combination of standard helicopter and conventional fixed-wing controls, offering little difficulty to an experienced airman. Flying the production Rotodyne, say the plane's engineers, will be as simple as handling the simplest twin-engine aircraft.

Needless to say, there are still problems to be overcome. Chief among these is noise. A helicopter is at best a noisy beast, and the Rotodyne's tip-jets create a noise problem all their own. Fairey engineers feel that, with the multi-nozzle silencers they've now developed and with the quieter Rolls-Royce Tyne engines slated for the production model, the noise problem will be taken care of.

Target date for the Rotodyne to enter public service is 1965. The RAF, British European Airways, and New York Airways (the helicopter line servicing the New York metropolitan area) have already stated their intention of purchasing substantial numbers of the first Rotodynes produced. And the Kaman Aircraft Corp. of Bloomfield, Conn., has acquired the license to produce the plane in the U. S. •

Teaching Son To Fish

[*Continued from page* 66]

ing. Let your son in on what you are doing and get him to help find the fish. If it is in the spring, he'll be quick to spot the beds. Later in the season the bluegills will be feeding in shallow water from the shoreline out to where the bottom drops off into deep water. He'll help spot the little swirls that tell where the fish are chasing small bugs or taking flies off the surface. In midsummer this will be during early morning and late afternoon. During hot middays, fish lie in deep water and are hard to find. In the fall, they spread out again along shallow shorelines, and are once more easy to locate and catch.

The fifth step is the proper baiting of the hook. The worm should be lively. Run the hook *just once* through the worm about halfway down and leave the barb showing. Do not thread the worm on the hook.

If a small bobber is used, adjust it on the line so it will keep the worm a fraction of an inch off the bottom when fishing close to shore, in very shallow water. In deep water during midsummer, keep the bait at the depth where the fish are resting.

The next or sixth step is teach how to cast a worm with a fly rod. This is more difficult. My suggestion is that you don't try to get him to actually cast the worm. Too often boys flip the soft bait off the hook when casting. Instead, teach him to swing the worm gently in a wide arc from the side. To do this, he should strip about 20 feet of line from the reel and hold it coiled in his left hand. Then, with the worm about three feet from the rod tip, he should swing his rod back, then bring it forward fast. When he has brought the rod straight forward he should release the line in his hand. It will then shoot out through the guides and place the worm 23 feet from the tip of his rod. He should gain reasonable accuracy after a few tries.

Step seven is also very important for it deals with fishing the worm after it is cast. When fishing in a river or stream with an appreciable current, show your son how to let the current take the worm downstream in a natural drift. To do this he casts across the current to a spot a little above where the bluegills are feeding. Then he lets the current carry the worm along bottom. Chances are a bluegill will grab it before it has gone far. But if he gets no action on a cast, he should let the bait drift till it is directly below him. Then he should bring it toward him slowly with little jerks, and wind the line into a loop in his left hand, ready for the next cast.

If he is fishing a lake or a still water pool, he should cast to the feeding fish and let the worm sink to the bottom. Then he should bring the bait toward him slowly along the bottom in tiny jerks.

Youngsters (along with a lot of adults) are prone to strike too fast and too hard when a fish grabs the bait. Bluegills have very small mouths. It takes them a few seconds to swallow even a small worm. Therefore step eight is to give the fish plenty of time to swallow the bait before setting the hook. Let the fish run off with the worm a bit. Then be sure your young angler gives the rod only a short, sharp jerk.

Step nine is showing him how to play a fish and net it. Teach your boy to lift his rod high as soon as the fish is solidly hooked, and to keep it up. The flexing of the high-held rod will tire the fish quickly.

When it is ready to quit, the bluegill will surface and turn on its side. Then your son should reel it close enough to net. At this point, show him how to dip the net into the water, hold it still and draw the fish into it. He should not scoop the net toward the fish and try to catch the fish in it. Then tell your boy to lift the net quickly.

These nine steps will teach your young angler the fundamentals of fishing and prepare him for bigger game in a few years. The tenth step is the cookout on the banks of the lake or river. This can be very simple—a few fish fried over an open fire along with some boiled potatoes and onions. Your boy will love this as much as the fishing. And probably you will too! •

Six Secrets Of Money

[*Continued from page* 77]

pros and cons of a proposition, takes all the steps he can to reduce his risk to a minimum—then and only then does he take the gamble."

• *They aren't security-minded.* Dr. Dichter declares: "Many university studies all over the country disclose that young people today are willing to settle for safe and steady niches in the business world. Successful men, on the other hand, are not satisfied with just security."

In many instances, psychiatrists point out, successful men have strong power drives. "For one reason or another," explained a New York psychiatrist, "they long for control over things, over men or their environment. Sometimes it's a strong reaction from poverty in their youth. Sometimes a power lust comes from real or fancied grievances. Whatever the cause, these men can't rest until they possess the thing that can instantly be translated into power—money."

• *They know how to make their own good luck.* Most of the men who appear to be lucky have made themselves "luck prone." They have acquired traits of character that attract good luck to them.

For instance, was Stephen W. Harris "lucky" when he came across that item about the boom in mustache wax? Millions of others saw the same thing. Harris, however, had made himself receptive. For years he had been thinking in terms of new

[*Continued on next page*]

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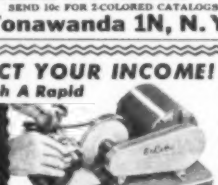

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ideas, new products, new money-making possibilities.

Marvin Small, a business success many times over, tells of the time a friend happened to call to tip him off about a foreign inventor who had created an odorless hair remover for women. It was the start of Nair, largest-selling depilatory on the market. Small made his own luck by spreading the word that he was actively interested in such a product. Thus many people knew of his interest and his chance of a "break" was considerably enhanced.

- *They want to get rich.* Maybe you're snickering, but this might well be the most significant characteristic of all, the psychologists point out. But doesn't everybody want to get rich? Everyone does—but not badly enough to make it happen for them.

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There you have them—the money-making mental secrets of the big rich:

- Think money.
- Keep doggedly at your goal.
- Take calculated risks.
- Give up being security-minded.
- Woo Lady Luck actively.
- Develop in yourself a powerful enough yen for the green stuff and there's a good chance you'll end up on top of the ladder before too many years fly past. And even if the rules only carry you half-way up—what's so wrong with that? •

Home Movie-Taking

[*Continued from page* 89]

gible. American producers no longer make double-8mm black-and-white because of the lack of demand. The only black-and-white film available is imported, such as Kinelux or Perutz, costing $3.18 a roll, which includes the cost of processing.

Kodachrome, Kodak's color film, costs $2.85 for a spool of 25-foot double-8mm, which becomes 50 feet of film after processing. Processing of spooled Kodachrome costs $1.75. Magazine load of Kodachrome, containing 25 feet of double-8mm, costs

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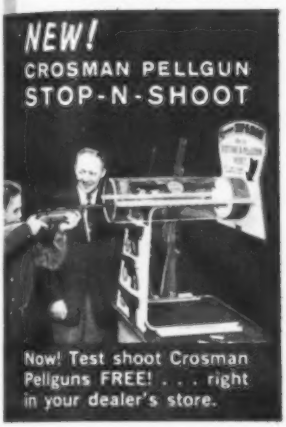

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$4.15. Processing of a magazine costs $1.40.

Kodachrome is made in Daylight Type for outdoor use and in Type A for indoor use with photoflood lamps. Indoor Type A Kodachrome can be used outdoors by slipping a Kodak Daylight Filter No. 85 over the lens. Outdoor film can be used indoors with a Kodak Photoflood Filter No. 80B over the lens, but this is not recommended because of a 50 per cent light loss and only fair color rendition. Outdoor Kodachrome should be used for picture-taking indoors under fluorescent lights. The color temperature of fluorescent light is close to sunlight. If you have a magazine camera, you need no filters. You change magazines containing different types of film in mid-roll without losing any film.

Kodak has a simple camera for the beginner—Brownie 8 with f/2.7 lens ($24.50). It has an enclosed optical viewfinder with parallax correction; this means that your camera photographs what you see through the viewfinder. The camera has a fold-away crank handle and a footage meter which automatically resets after loading. It will also accept a light bar to be used when taking indoor movies.

The Kodak Brownie 8, with f/1.9 lens, sells for $34.50. This camera has a color-coded finder for use with lens converters ($14.75) that permit taking wide-angle and telephoto scenes.

A single lens 8mm movie camera (such as the Brownie 8) is equipped with a normal 13mm focal length lens. This normal lens "sees" the same scene your eye does. You can screw a wide-angle lens-converter into the front of your fixed normal lens and shorten its focal length. Your lens will then see a wider field of view.

A telephoto lens-converter does the opposite. By lengthening the focal length, your lens "sees" a narrower field of view than does your eye. Fewer objects over a narrower area are included in the scene. The effect is one of magnification that permits close-up shots of distant objects.

A simple-to-operate camera which accepts screw-in wide-angle and telephoto lens-converters is the miniaturized Bolsey single-8mm job. It is smaller than a king-size pack of cigarettes and weighs 12

[*Continued on next page*]

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ounces. The camera loads a thin magazine of 25-foot single-8mm film. Single-8mm means that after processing you get back 25 feet of film. Bolsey film magazines, containing daylight Kodachrome or Indoor Type A Kodachrome, cost $2.75 each, including processing at Bolsey laboratories. The camera also takes still pictures for which it has variable shutter speeds of 1/50 to 1/600th of a second. It also has a lock device which permits self-filming. The Bolsey 8 is sold with two Kodachrome magazines for $99.50.

On some single-lens movie cameras the normal lenses are entirely removable by means of interchangeable lens mounts into which wide-angle and telephoto lenses can be screwed. The Yashica 8S ($49.95) is such a camera. It has a zoom viewfinder which adjusts for lenses of from 6.5mm to 38mm focal length, thus providing a view of the area covered by any lens, whether normal, wide-angle or telephoto.

Turret model 8mm cameras have three lenses—wide-angle, normal and telephoto—mounted on a wheel in front of the camera so that you can switch from normal to wide-angle to telephoto and back again in seconds. The Kodak Brownie Turret f/1.9 ($59.50) is such a camera.

Another turret, the Swiss Bolex D-8L, has a built-in light meter. This camera offers seven filming speeds: 12, 16, 18, 24, 32, 48, and 64 frames per second. Depending on your choice of lenses, Bolex prices start at $296.50.

The Argus Cinetronic M3 three-lens turret camera ($119.95) has a built-in light meter coupled to the diaphragm opening. The meter automatically adjusts the lens opening to meet changing light conditions after you have set a dial to the speed of the film you are using. A matching viewfinder to each lens automatically comes into position as the turret is rotated.

The three-turret Eumig Electric R ($99.95) is powered by four penlight batteries which eliminate handwinding and has a built-in, uncoupled light meter.

A zoom lens is one with a continuously variable focal length. It is wide-angle, normal and telephoto lens all in one. A zoom lens can embrace two football teams in its field of view, then close in for a close-up view of the ball carrier.

All zoom cameras described here have

built-in light meters coupled to the zoom lens that automatically adjust the lens openings to light conditions. Each has a zoom-viewfinder coupled to the lens that gives an exact field of view as the taking-lens zooms from wide-angle to normal to telephoto. All are spool-loading models.

The Bell & Howell Zoomatic Director Model 414 ($209.95) has a focusing zoom lens that permits shooting from as close as six feet. The zoom is operated manually.

The Wollensak Power Zoom, Model C-56-D ($199.50) has a power-driven zoom lens. One button controls the picture-taking motor. Two additional buttons control the motor that zooms the lens in and out and simultaneously operate the picture-taking motor.

The Kodak Zoom 8 Reflex camera ($189.50) provides "through-the-lens" viewing. You see the same picture that your zoom lens is viewing. The lens can be focused for close-ups to six feet or for shots of distant scenes. One button both power-zooms the lens and runs the picture-taking mechanism. The light meter, in addition to automatic coupling to the zoom lens, can be locked manually for a reading of a subject against a contrasting background, an important feature for accurate exposure control.

The Wittnauer Cine-Twin-Zoom-800 ($259.95) has an electric motor drive powered by three flashlight batteries. This camera converts into its own zoom-lens projector.

Now, how about projectors and screens?

The least expensive of projectors, the Kodak Brownie 8 Movie Projector, Model 10 ($44.50), satisfactorily projects a three-foot-wide picture at a distance of 12 feet. It has no-sprocket threading for easy loading and a 200-foot, 15-minute reel capacity.

Kodak's Brownie 8 Movie Projector, Model A15 ($54.50), has automatic self-threading to take-up reel, throws a four-foot-wide picture at a distance of 16 feet.

The Kodak Cine Showtime Projector, Model A30 ($149.50) projects a bright image up to five feet wide and has a 400-foot capacity for uninterrupted half-hour showings. Forward projection, stills, reverse and power rewind are controlled from one illuminated panel. Projector is self-threading to the take-up reel and has

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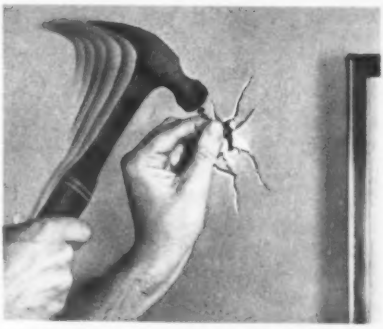

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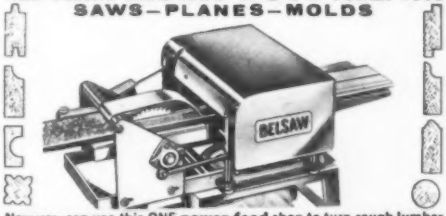

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a built-in dry splicer for editing of films. This model has a new push-pull zoom projection lens which can fill a 40-inch screen at any projection distance between 12 and 19 feet.

DeJur, Wollensak, Argus, Bell & Howell and Keystone also offer automatic-threading zoom-lens projectors in the same price range with minor variations in the conveniences offered.

There are two ways of adding sound to your motion pictures. One method is to record "lip-synched" (sound synchronized with lip movements) sound simultaneously with your picture-taking. The Fairchild Cinephonic Eight Sound Movie Camera does this with a 25 mil magnetic stripe which records sound and takes movies on one film. The unit's microphone is sensitive enough to pick up normal conversation from a distance of nine feet. The camera is powered by a nickel cadmium battery which can be recharged from an ordinary light socket. A choice of two camera speeds, 16 and 24 frames per second, is provided. The single-lens camera with built-in sound-recording unit, earphone monitor, microphone and stand, battery and recharge cord lists for $239.50. Film for this camera is special Fairchild Cinephonic Film, a color film manufactured by Ansco. A 50-foot double-8mm film roll (100 feet after processing), sells for $7.50. Cost of processing is extra.

The mate to Fairchild's sound camera is its Fairchild Cinephonic Eight Sound Movie Projector with built-in sound amplifier, recording and erase head and separately housed speaker unit and microphone. It can project 8mm sound movies and record, erase or overlay additional sound. The projector sells for $249.50.

The Kodak Sound 8 Projector, Model 1, with microphone, phono connector cord and built-in speaker, sells for $345. The Agfa Sonector-8 projector with Agfa Sonector-Phon attachment will dub sound in on your film after it has been processed and striped. Without loudspeaker, this unit sells for $299. Tandberg of America, Inc. offers its Elite 8mm Magnetic Recording Projector with microphone and built-in speaker at a list price of $365. The same unit with a zoom projection lens lists for $385.

Projection screens are made in four sur-

faces: glass-beaded, mat white, metallic and lenticular. Glass-beaded and aluminized or silvered screens give a brighter color image than mat screens, but dim the image for those sitting at a sharp angle to the screen. Aluminized screens are necessary for showing three-dimensional movies. A lenticular screen has vertical ridges and valleys embossed into its surface, provides a wider, brighter viewing area than is obtainable with plain silver or glass beaded. Da-Lite's portable tripod screen with a 30x40-inch glass-beaded surface sells for $12.95; with mat white surface, $22.95. The 40x40-inch screen, with a lenticular silver surface sells for $39.95.

For editing film you need an editor-viewer-splicer. Kodak's Junior Movie Splicer costs $2.95; their Presstape Movie Splicer, which does dry splicing, is $7.50. Baia's combined editor-view-splicer, which projects your film on a desk-top-enclosed screen for easy editing, lists for $34.95.

There are also various devices for making close-up title shots with your camera. These range from $16 to $300.

For indoor shooting, use medium-beam 300-watt reflector-type photo-flood lamps, to which indoor Kodachrome Type A is balanced. Lamps cost $1.25 each. Light bars which accept these lamps and screw into the accessory hole of your camera are priced at $5.95 for a two-lamp bar and $10.75 for a four-lamp bar.

There are many kinds of 8mm cameras, projectors, screens and accessories available. Choose the equipment that matches your budget and your needs. A world of picture-making fun will be yours once you start shooting. •

(Next month author Schutzer will discuss the techniques of home movie-making and give you some hot tips on how to take home movies like a professional. Don't miss Part II of this article in the July MI!)

Vacationing In A Trailer

[*Continued from page* 99]

formation on trailering in France write Federation Internationale de Camping et de Caravanning, 218 Boulevard Saint-Germain, Paris (7e) for where-to-rent-it information.

[*Continued on next page*]

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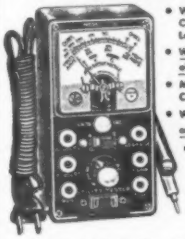

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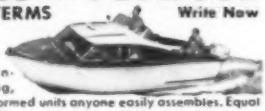

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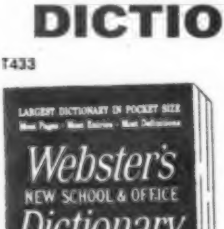

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What of luxury trailer villages and wilderness hideaways closer to home, in all 50 states, Canada and Mexico? Fifty cents buys you Travel and Vacation Trailer Park Guide. This booklet's 100 pages list 1,697 trailer parks and 815 national and state park sites. The guide, published by Mobile Homes Manufacturers Assn., 20 North Wacker Drive, Chicago 6, Ill., tells you what's available where, how much it costs, whether there's a playground for the kids, a pool for mom and fishing for dad.

For those of you who are beginning to think of taking your own trailer vacation, here's some of the low-down on rates, fees, provisioning, laws governing the use of trailers and other practical matters:

Rates: Average vacation-size rental trailers (up to 15 ft.) are pegged $25-$55 a week, with $35 an average rental price. With bathroom or shower your rent jumps to $75-$90—still a vacation bargain.

Rental Fee In Advance: Rental fees are usually collected in advance. You'll be asked to show your car registration and driver's license.

Insurance: The rental dealer usually insures the trailer for collision damage, $100 deductible (which you pay if the trailer is damaged). Better check your own insurance agent to be sure your liability coverage extends to the trailer as well as to your car.

Hitch: **Most dealers rent** hitches. Others will sell you an inexpensive car hitch for about $25, may charge $5-$7 for installation. If you rent a longer, more luxurious 17-footer (and up), you may have to install a load equalizer or overload springs on the car, items which run $50 to $100 in addition to the weekly rental fee. Load equalizers (or "levelers") are designed to keep the trailer level. (A car without equalizer, if pulling a heavier-than 1,500-lb. trailer, rides front-high). The trailer rental man will advise you which hitch will be best for the trailer you're pulling.

Packing Food: There's room in the rental trailer to pack food enough for the whole family—for a week or longer. Perishables, though, present some problems. Economy trailers usually come equipped with ice boxes (so frozen foods can't be toted). Trailers 15-ft. and up may be

rigged either with an electric refrigerator (complete with freezer) or a butane-run cold box. Electric units must be plugged in at a trailer stop. On the highway, you'll need to load electric boxes with ice since few small, car-towed trailers have auxiliary electric power to run, en route, an electric refrigerator. Best bet for vacationers is a butane refrigerator, which stays cold and keeps running on road or off.

Clean Clothes: Few if any vacation-sized rental trailers have laundry facilities. But most trailer stops (including those in national and state parks) do.

Special Road Laws: Your rental trailer will be equipped with running lights, directional signals and brakes as required by your state laws (usually pegged to the trailer's loaded weight). In one typical state, trailers weighing over 1,500 lbs. (loaded) must have brakes operated from the car. Trailers 15 feet or shorter generally weigh less than 1,500 lbs. laden. Patronize a reputable rental dealer and you can be assured that the unit he rents you satisfies the state laws.

Rules Of The Road: Your regular driver's license is all you need to tow a trailer. But some states have road rules for trailerites. One state—fairly typical—sets a 45-mph speed limit on cars towing trailers. Another won't permit you to camp for the night on a highway's shoulder or right-of-way. You've got to pull off the road a good ways—or find a camping ground. Another state rules that two trailer-toting cars, one behind the other, must keep 300-feet distance. Almost all require you to keep to the right-hand (slow) lane except when passing. Along some wind-prone western desert roads, state police may halt trailer-hauling cars during windy periods. Reason: gusts can topple trailers. Check state laws before shoving off.

Trailer Handling: Pulling a small vacation-sized trailer presents but few problems. You get the feel of things quickly, say most trailer vacationers. The one problem which bothers some is backing. Some dealers will take you for a practice back-up exercise. Others advise a little practice on a vacant parking lot. One big western dealer says it's easy to get the

[*Continued on next page*]

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knack if you back with your hands on the bottom of the steering wheel. That way, when your hands move left, you know that the trailer's rear is also moving left. And when your hands move right, the trailer's rear is moving the same direction. Here are some backing rules: (1) Back slowly. (2) Where possible, back along an arc or curve, so you can see the trailer's rear. (3) Before you back, get out to check for rocks, potholes, or obstructions. And if you're a novice, station a backer-helper to guide you in.

There's the story on trailer vacations—the biggest bargain in time-off travel and adventure. Get in on the fun! •

Germany Marches Again

[*Continued from page* 73]

discarded when it was found German-made arms did the job better.

The German air force is similarly well-equipped. Planes from the U.S., Canada and Great Britain provide the nucleus of the interceptor force. With a recent order for 730 additional F-104s, Germany will have 2,000 front-line planes and 100,000 men—one of the best-equipped and trained air forces in the world.

The German navy is limited to coastal defense. About 30,000 men and 170 light combat craft are on the rolls at present, along with a few "training submarines."

In all, there are presently about 350,000 men under arms in Germany, operating under NATO command. It is the second most powerful force on the continent.

Missing—by design—are the soup kettle helmets of World War II and—oh, yes—no more goose-stepping. •

Liverwort And Origin Theories

The stone remains of a little liverwort, one of the world's most common plants, may upset scientists' theories about how long life has existed on earth. Discovered in the Catskill Mountains by graduate student Francis M. Hueber working under Prof. Harlan P. Banks of the New York State College of Agriculture, the fossil was found to date back 330,000,000 years to the Age of the Fishes.

The discoverers believe that liverworts may have existed as far back as the Cambrian Age. This would mean that land plants and perhaps life itself have a longer history on earth than scientists have thought.

DATING THE PAST

FOR a half-century after famed Piltdown Man was uncovered, nobody knew for sure if he was man's legitimate ancestor or not. In 1953 it was proved he's a fake.

For about the same period scientists questioned the authenticity of *Pithecanthropus*—the Java Ape Man. Less than a dozen years ago this question also was answered. This fellow is genuine.

Both these riddles were solved by fluorine tests, just one of the dozen archeological dating techniques recently perfected.

Dating the past used to be largely a matter of counting back. For example, one ancient dwelling was quickly labeled 1,200 years old; archeologists counted growth rings of trees rooted in the floor. In the case of an ax found in glacial debris, scientists counted the "varves"—annual melt-water deposits—and found the implement to be 10,500 years old.

Trouble is, tree-ring, varve counting and the like aren't wholly reliable. Last year, UCLA's Willard F. Libby won a Nobel prize for finding an accurate timepiece—carbon-14.

Atmospheric radioactive carbon is absorbed by all living things. When plants or animals die, the radiocarbon decays, half in 5,760 years. Date of death is determined by measuring the remaining carbon-14.

Carbon-14 is today supplemented by four dating methods:

- Glass corrosion layers build up annually when glass is surrounded by water. Measure the layers and you've got the age.
- Obsidian, used by primitive man for weapons, absorbs water at a set rate. Accurately measured, it's expected to date objects 100,000 years and more.
- Thermoluminescence is the glow given off by reheated pottery. The stronger the glow, the longer since the last firing. Reason: heating releases electrons formed by radioactive decay.
- Fluorine slowly seeps into bone matter over the ages. Two pieces the same age in the same place absorb the same amount.

Even the earth itself is finally finding its tongue. The language: radioactivity. By comparing isotopes with their decay products, geochronologists are learning to count back hundreds of millions of years.

And by a similar process, we now can determine the age of the whole solar system by analyzing gases trapped in crevices in meteorites. Assuming these heavenly timepieces were formed at about the same time as Earth, scientists have tentatively established the date of creation at 4.7 billion years ago.

—*Robert Gannon*

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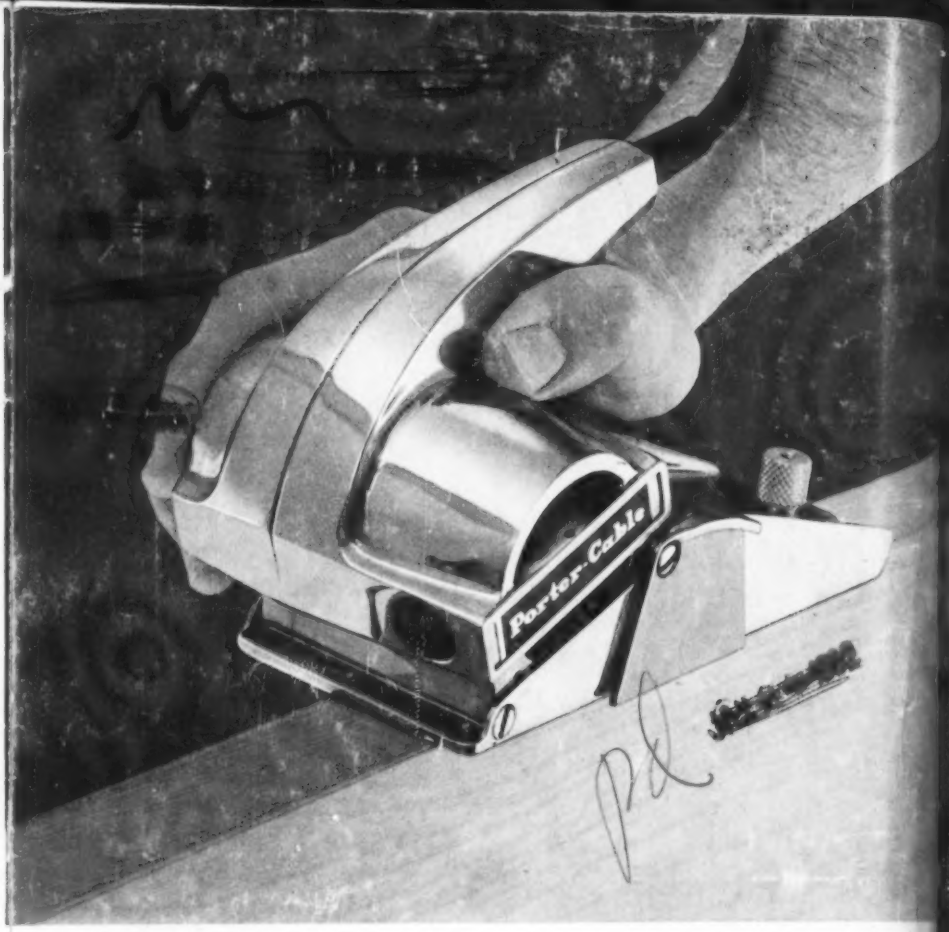

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